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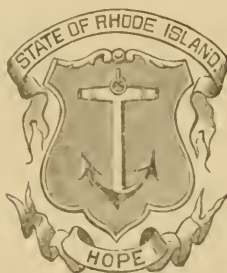
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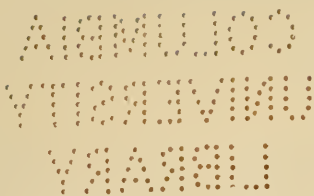


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TWELFTH ANNUAL REPORT
OF THE
STATE BOARD OF HEALTH,
OF THE
STATE OF RHODE ISLAND,
FOR THE YEAR ENDING DECEMBER 31, 1889,
AND INCLUDING THE REPORT UPON THE REGISTRATION OF
BIRTHS, MARRIAGES AND DEATHS IN 1888.



PROVIDENCE:
E. L. FREEMAN & SON, STATE PRINTERS.
1890.



MEMBERS
OF THE
RHODE ISLAND STATE BOARD OF HEALTH.
DECEMBER 31, 1889.

Post Office Address.

HENRY E. TURNER, M. D., <i>Chairman</i>	NEWPORT.....	NEWPORT COUNTY.
SAMUEL M. GRAY, C. E.....	PROVIDENCE	PROVIDENCE CO.
ALBERT G. SPRAGUE, M. D.....	RIVER POINT.....	KENT COUNTY.
ALVIN H. ECCLESTON, M. D.....	WOOD RIVER JUNC..	WASHINGTON CO.
PAUL S. REDFIELD, M. D.....	PROVIDENCE	PROVIDENCE CO.
HENRY S. SWAN, M. D.....	BRISTOL.....	BRISTOL COUNTY.
CHARLES H. FISHER, M. D., <i>ex officio and Secretary</i> ..	PROVIDENCE.....	PROVIDENCE CO.

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INTRODUCTORY.

GENERAL REPORT.

To the Honorable the General Assembly:

In behalf of the State Board of Health, the Twelfth Annual Report of the Board is herewith respectfully presented in compliance with the Public Statutes.

The report is for the year ending December 31, 1889.

It is with great satisfaction that the board can allude at this time to the fact of an increasing recognition, on the part of the people, of the importance of health and of the means of preserving it, as indispensable requirements for the enjoyment of private and personal happiness, and for the best moral welfare and fullest material prosperity of the State.

The fact of the gradual progress and decided advance in the sanitary sentiments of the general public, is evinced by the action of the various town authorities, (who usually have the people behind them), in the enactment of sanitary ordinances, with increasing stringency and better enforcement from year to year; by the demands of the people for pure or good water, as shown by the eager inquiries as to the means of obtainment by water works and otherwise; by the more universal demand for the abatement of nuisances believed to be prejudicial to health; by the more general practice, in most of the compact localities, of the prompt removal of garbage and house refuse; by the largely increased number who seek after and read the various sanitary publications of the day; by the greater attention to personal cleanliness, as shown by the larger purchase and larger inquiry as to appliances for household ablutions; and by greater attention to drainage and other methods of the disposal of household and other sewage.

The public conception of the value of health, and the means of preservation, is undeniably much higher at the present time than it was ten years ago.

REPORT OF THE STATE BOARD OF HEALTH. PERSONNEL OF THE BOARD.

[1889.]

The term of membership of Henry W. Rose, M. D., of Westerly, having expired by limitation on the first of July, 1889, Gov. H. W. Ladd appointed Herbert J. Pomroy, M. D., of Westerly, as his successor. Dr. Pomroy having removed from the State before the end of the year, the Governor appointed Alvan H. Eccleston, M. D., of Richmond, to fill the vacancy, and the appointment was approved by the State Senate at the January Session of the General Assembly, 1890.

Otherwise, during the year 1889, the personnel of the board remained the same as at the time of making the last report.

WORK OF THE BOARD.

It is not deemed essential to report in this connection, in detail, the work performed by the secretary as the executive officer, under the direction or with the approval of the board during the year 1889, as such report would add largely to the size of the volume, and as the particulars of such work have been fully considered at the different meetings of the board during the year.

At the meetings the object has been to take cognizance of the interests of life and health among the citizens of the State ; to provide for investigation into the causes of disease when deemed to be advisable ; to take such measures for the prevention of disease in man and beast as circumstances seemed to require and the power and means at command of the board would allow.

The proceedings of the board have been, in relation to the above, the condition of the water supply of villages and shore resorts ; the removal or abatement of public nuisances believed to be detrimental to health, wherever found ; the proper drainage of compact collections of houses as to sink and laundry water ; the disposal, in such compact localities, of the house refuse and excreta of whatever kind liable to putrefactive decomposition ; the measures needful to be taken to prevent the transmission or spread of contagious diseases, from exposure to the emanation from the dead bodies of such as have died from such diseases ; the distribution of tracts and circulars in localities where contagious diseases break out, urging isolation of the sick and other methods of restriction of the disease ; the collection of vital statistics ; the adulterations of articles entering into the composition of food and drink ; the means needful in the discharge of

the duties imposed by the Public Statutes in the Cattle Commission department; and such other questions, having sanitary relations, as from time to time seemed to require attention.

The work of the secretary has been almost wholly within the lines above indicated. But notwithstanding the present advanced sanitary sentiment in many localities, the question is occasionally asked: "What is the good of all this oversight and sanitary administration?" Let us see. I quote the Registrar-General of England. "He points out that, according to the newest English life table, the children born in England in any one year have now divided among them 'nearly two million years of life' more than would have been the case thirty-five years ago. In England and Wales the annual mortality per 1,000,000 of population has been as follows: In 1861-5, 22,595; in 1866-70, 22,436; in 1871-5, 21,975; in 1876-80, 20,817; and in 1881-5, 19,310. Comparing the first period and the last, the difference is 3,285 per 1,000,000, and taking the population at 30,000,000, the total annual saving is about 100,000 lives. And if for every death there are twenty cases of sickness, then we have 2,000,000 less cases of sickness than in the first period. Interesting calculations have been often made on this subject, and especially by that father of sanitation, Mr. Edwin Chadwick, who, happily, is still with us, a witness of the greatness of the success that has attended his life's work. You can count the cost of each case of sickness, of lost work, of doctors' bills, and so on, and also the monetary value of each of the 100,000 lives saved. And you can put all this as income against the interest on the money spent in sanitary improvements—in water works, sewerage works, vaccination grants, officials' salaries, etc. And even on this lowest ground—on this merely commercial basis—we find that cleanliness, which is next to godliness, resembles godliness itself in being 'great gain.' But we can take a vastly higher standpoint. We also are laborers in the great field of moral reform. In this field there are many groups employed, each pursuing its own line, and each—ay, even the sanitarian—possibly apt to attach too much importance to his own particular department. The teetotaller holds that if intemperance were driven out of the land, then would follow education, cleanliness and religion. And, doubtless he is right. The educationist holds that if man's intellect were duly trained it would lead him to avoid alcohol, to avoid dirt, and to avoid immorality! Doubtless he too is right. The religionist holds that if man can be taught his duty to his God, he will do it also to

himself and to his fellow-man, and that education, cleanliness, and temperance will be the fruits of his religion. Again I say, doubtless he is right. And the sanitarian holds that if a man is provided with pure air, good food, and healthy exercise, he will then be in a bodily condition, which will produce no craving for the stimulus of alcohol, which will open his intellect to all the influences of education, and which will make him better able to receive and to appreciate the truths of religion. For, throughout our life, all good things are woven together, and thus it comes that the prosaic and ofttimes unattractive work of the sanitarian has in it an abounding helpfulness that overflows into every corner of man's being, and makes for his intellectual and his moral as well as for his physical welfare."

SANITARY INSPECTION OF TOWNS.

The secretary personally made sanitary inspections of the hotels and larger boarding houses in all the shore towns where such inspections were requested by the health officers of the same, reports of which have been made to the Board. He had also visited several other towns during the warm season, inspecting nuisances suspected of being dangerous to health, either in company with the health officer or alone, giving advice in relation to methods of abatement when necessary; had traversed numerous villages, large and small, in the State, inspecting the quality of the water in most general use, and the sources of supply; the drainage of the houses and disposal of night soil and other organic filth. Suggestions as to urgently needed changes were made to individuals, corporations or town authorities, as the circumstances seemed to require. In most instances the suggestions were kindly received and in a large number were fully, or to a considerable extent, carried out, not unfrequently under the supervision of the town health officer. Occasionally a report to the town council was required and peremptory orders issued.

WATER SUPPLIES.

The statement that a pure water supply, or a supply of water uncontaminated with any deleterious material, is absolutely essential to the preservation of health, will not be contradicted. It is a fact however to be deplored, that so large a proportion (though much less than a few years ago) of the water used for domestic purposes and especially for drinking, is not free from impure constituents. There

is, however, a very general, earnest and gratifying inquiry as to the means of procuring good water on the part of the citizens of the State, and the report upon the water works in the State, on subsequent pages, will be a source of information to many.

SEWERAGE.

The questions of public and private plans and systems of sewerage are largely and necessarily occupying public attention. The city of Providence (although in possession of a limited and temporary system that has been of inestimable value) began during the last part of the year, the construction of a very elaborate and complete system with disposal by precipitation.

The design is, that by extensions as needed, it will take care of the sewage of a population of 300,000 or perhaps 400,000.

Other cities, and some of the larger towns, have temporary systems and some are agitating systems more complete.

DISPOSAL OF GARBAGE, ETC.

The frequent removal of garbage, including swill and other house refuse from the premises when accumulating in the cities and many of the compact villages, is provided for by municipal ordinances. The disposition of such material varies in the different localities. It has been fed to cattle and hogs in out of the way places in the country towns, which method of disposal it can, with great satisfaction be said, is "becoming smaller by degrees and beautifully less."

It is also carried into the country from some towns for composting and ploughing in. It has not been found of great value as a fertilizer.

It has also been carried out to sea and fed to the fishes. Evidence is furnished that a considerable part of fresh sewage and garbage is greedily devoured by fishes. As to the quality of such fish as compared with swill fed beef and pork, evidence is not attainable.

Destruction by fire is undoubtedly the disposal *par excellence*.

Crematories have been in operation during the year in Providence city and Newport city. The work of the crematory in Providence shows evidence of assured success. The crematory in Newport has been less successful, at least in point of economy.

VITAL STATISTICS.

It may seem quite unnecessary to say that by the annual collection and record of *births*, *marriages* and *deaths*, the State is apprised of

the gain or loss in, not only its most important, but its absolutely indispensable constituent—that is, the population.

By a record of *diseases* and *mortality*, it is also apprised of the gain or loss in that essential element that constitutes the value of the population—that is, public health.

A large excess of births over the deaths is understood to indicate not only an increase of the population, but a high degree of physical vigor, healthfulness, enterprise, courage and extended length of life. A lessened birth-rate and increased death-rate is the ominous sign of a decadence, not only of the bodily vigor of the people, but of the national strength, prosperity and power.

By an annual census of births and deaths, the State or country can ascertain, in a considerable measure, its reserve of sturdy individuals and its probable rise or decline, and be prepared to promote the one or avert the other. It is also known that a record of births, marriages and deaths is indispensable in the tracing of the lines of genealogy or lineage, in the proof of regular descent, and in the establishment of right to entailments and ordinary inheritance.

But vital statistics have come in modern times to subserve much more extended uses. When collected, classified, arranged and collated in tables, they become the basis of much scientific study. In addition to their original application relative to civil and national life, in affording evidence of legal consanguinity; the prevailing public spirit and the moral tone of the social relations and disposition for associated interest, as shown by the marriage statistics and legitimate birth-rates; there are also other very important industrial, corporate and sanitary relations.

They furnish the data for determining the expectations of life at different ages, and are therefore the basis of life insurance, beneficial and annuity associations.

They furnish to medical science information of the highest value in regard to the relations of disease to locality, climate, sex, season, race, and the variations of the public health from year to year under different topographical and meteorological conditions. To the sanitarian they are indispensable.

The report upon the registration of vital statistics for the year 1888, was prepared during 1889, and contains several tables additional to the previous report, which were deemed needful to illustrate some special illustration and make the work more complete.

The collation, arrangement, classification and tabulation, required the placing of about 1,600,000 figures in the notation of the various items of fact.

TRANSPORTATION OF THE DEAD.

The occasional contraction of contagious disease from a dead body, in transit or at destination, and the sometimes epidemic and largely fatal prevalence of the same as a result, has been a matter of considerable concern to the public. In view of this fact the National Association of General Baggage Agents proposed the formulation by State Boards of Health, by modification of their own or otherwise, of a set of rules which should prevent such dire accidents. The following communication was therefore forwarded to the association, as expressing the sentiments and opinion of the Rhode Island Board :

To the National Association of General Baggage Agents :

The State Board of Health of the State of Rhode Island, in response to your request, recommend the following rules in relation to the transportation of the bodies of the dead :

1. The transportation of the bodies of persons dead of Small Pox, Asiatic Cholera, Typhus Fever or Yellow Fever, is absolutely forbidden.

2. The bodies of those who have died of Diphtheria, Scarlet Fever, Typhoid Fever, Erysipelas, Measles, and other contagious, infectious, or communicable diseases must be wrapped in a sheet thoroughly saturated with a strong solution of chloride of zinc, or chloride of lime, in the proportion of one-half pound of either chloride to a gallon of water ; or a strong solution of not less than two per cent. of the bi-chloride of mercury, and enclosed in a strong, tight wooden box.

3. In cases of contagious, infectious, or communicable diseases, the body must not be accompanied by attached articles or coverings which, (unless previously disinfected), have been exposed to the infection of the disease. And in addition to a permit from the Board of Health, or other medical or legal authority, baggage agents will require an affidavit from the shipping undertaker, stating how body has been prepared, and kind of coffin used, which must be in conformity with rule 2, and that the health officer or other legal authority of the locality, to which the body is consigned, has had such timely notice of the hour of its arrival within his jurisdiction as will enable him to supervise its reception.

4. The bodies of persons recently dead of diseases that are *not* contagious, infectious or communicable, may be received for transportation when encased in a sound coffin or metallic case, and enclosed in a *strong wooden box securely fastened* so it may be safely handled.

5. Every dead body must be accompanied by a person in charge who must be provided with a ticket, and also with a *permit*, as provided in rule 3, giving permission for the removal, and showing name of deceased, cause of death, and whether of a contagious or infectious nature.

6. The *permit* from a Board of Health, health officer, or other authority, must be issued in duplicate, the original to accompany body to destination,

the duplicate copy will be retained by the agent at the initial point and sent to the General Baggage Agent.

7. It is intended that no dead body shall be moved which may be the means of spreading disease; therefore, all *disinterred* bodies, dead from any disease or cause, will be treated as infectious and dangerous to public health, and will not be accepted for transportation unless enclosed in a new wooden box, made air tight if possible, and said removal has been approved by the State Board of Health, or the consent of the health officer or other legal authority of the locality to which the corpse is consigned, has first been obtained.

In submitting these rules for consideration, it is not assumed that they are perfect, but are recommendations which, in our opinion, will be in the interests of the public health, and at the same time not unnecessarily burdensome and expensive to the public.

It has previously been suggested that it was obvious, that infectious or communicable diseases follow more quickly the lines of communication, being spread by the movements of the people; and as the railroads are the principal medium of communication among the people, the trunk lines spanning the continent, bringing to our doors inhabitants from all parts of the country, it is patent to all that local rules, be they ever so rigid, can afford but partial protection, and as the bodies of the dead are transported in the same cars and among the baggage containing the wearing apparel of the passengers, the necessity for some effective rules, which will apply the same in all the States, is the more apparent. It seems that this can be accomplished, and our coöperation to that end will be cordially given.

We believe it is a good policy to have a list of specified dangerous diseases that should not be carried, as in rule 1.

In preparing bodies for shipment, it is *not necessary* that the cavities be injected if prepared otherwise as in rule 2, although such preparation skilfully accomplished would be of *some* advantage. Embalming as usually performed, is of doubtful value. And when well performed the expense need not necessarily be above ten dollars.

The expense of so-called air tight zinc, copper, lead lined or iron coffins or caskets would be entirely prohibitory on the part of many people, and at times because of distance from procurement, very difficult if not entirely impossible to obtain at any expense, and very seldom, if of any additional safety to rule 2.

There is no standard by which undertakers in Rhode Island are graded to ascertain whether competent or not before being allowed to practice the art of embalming. We think each State should require every undertaker to take out a license and pass examination before a competent board of examiners before he is allowed to prepare a dead body for shipment.

There is no penalty in this State for making false affidavit or issuing false certificate, either as to cause of death or as to the preparation of a body for transportation, except as for a misdemeanor at common law. Legislation should give the necessary protection.

It is desirable that all permits for the removal of dead bodies be issued by Boards of Health, health officers or other competent legal authority, and this can be done in all cases even in small towns or country districts.

It is also desirable that a nearly uniform style of removal permits be used, to insure definite and necessary information, to enable persons to transport dead bodies through several States without danger of being stopped at some intermediate point. Samples of permits used in this State included.

By order of the Board,

CHAS. H. FISHER, *Secretary*.

OFFICE WORK.

An account of the current office work in detail would obviously, because of its varied character, extend a report to an unwonted length. Allusion has already been made as to the enormous amount of work required in the preparation of the reports on the vital statistics.

Briefly, all changes in the laws having relation to the duties of physicians, town clerks and undertakers, which occur nearly every year, are written out and explained, as they may have application to either of the occupations—600 persons or more in all, with blanks for each, changed to meet the requirements of law; the prompt and continued forwarding of a supply of other blanks as needed to town and city clerks for monthly and annual returns of deaths, and of births and marriages; blanks for an account of improvements of a sanitary character in the towns and of new sanitary ordinances; also, to physicians for monthly report of prevalent diseases, distributed monthly, and for physicians returns of cause of death to town and city clerks, and for annual general returns; also to clergymen the blank certificates of marriage; and to undertakers the blanks for returns of death to town and city clerks, and blanks for undertaker's notice to physicians; also, to health officers for annual returns of duties attended to and work accomplished.

Other circulars are written and distributed to various town officials and other parties, having duties under the laws in relation to public health and the vital statistics of the State, reminding them of those duties, suggesting methods of performance and urging their prompt discharge.

Distribution is made, when occasion requires, of the tracts for the "Prevention of Typhoid Fever" and "Prevention of Scarlet Fever," the "Manual" prepared for the use of health officers, the "Nomenclature" of diseases for the use of physicians, and the posters, "Treatment of the Drowned," when called for. In some of the pub-

lie schools the rules of the latter are committed to memory by the senior class and recitations thereof given every week.

A record of the investigations of cases of contagious diseases of domestic animals, the date, the name of the owner, the location, the characteristics of the disease and other notes. (See Report of the Cattle Commission department.)

The publication of the MONTHLY BULLETIN has been continued through the year, for which the secretary has written 94 articles, long and short ; has prepared 12 summaries of deaths, with sex, parentage and ages ; 24 pages of causes of deaths and number, with comments and percentages ; and 24 pages of meteorological observations and summaries. Supervision is also given to printing, correcting proofs, addressing, wrapping, mailing and other methods of distribution of copies. The MONTHLY now reaches over 1,000 of the teachers in the public schools of the State.

There were 1,268 letters written by the secretary during the year, about 150 of which were to parties in different States and countries, in reply to inquiries for various kinds of information.

The number of blanks necessarily sent out for returns and reports from different officials and professions, and at different times during the year, for purposes within the province and duties of the Board, exceeded 20,000.

The report upon "Tuberculosis among the neat-cattle in the State," and the preparation of the Eleventh Report of the Board, comprising 177 pages, including Tuberculosis, were among the duties and work of the secretary during the year, in addition to the preparation of the Report on vital statistics comprising 220 pages, or about 400 pages of printed reports in all, and about 130 pages of original matter for the MONTHLY BULLETIN.

CATTLE COMMISSION.

Differing from other States, the Cattle Commission of Rhode Island is vested in the State Board of Health. The duties in this department consume a large amount of time. For the purpose of securing an economical administration of the duties incumbent in this department, the secretary has personally performed a considerable part of the veterinary work.

Some part of 168 days was occupied by him during 1889, in the investigation and examination of cases of domestic animals, having or suspected of having contagious or infectious diseases.

The cases included glanders and farcy, tuberculosis, cow pox, swine plague and various other diseases, having some symptoms in common with contagious diseases.

GLANDERS.

Of 114 cases of suspected glanders or farcy, 78 were confirmed and destroyed. Some of the cases were visited two, three or more times. 156 different animals, equine, bovine and porcine came under investigation during the year.

1,424 horses were inspected by the secretary during the year, comprising team, market, railway, hack, express, carriage and other horses in the city, the country and at the State Fair.

TUBERCULOSIS.

The large prevalence of tuberculosis among the bovine animals of the State makes the subject a question of very grave importance, inasmuch as the consensus of medical opinion is to the effect that the disease is identical in its specific cause with phthisis pulmonalis, or tubercular consumption in mankind, and that the disease may be communicated from bovine animals to mankind by reason of the specific virus—the tubercle bacillus—transmitted by ingestion of the meat or milk.

The following in respect to such transmission, from Dr. Robert Koch, a privy councillor in the German empire, the first to demonstrate, eight years ago, the exact relation of tuberculosis to a specific bacillus as its cause, and who is by universal acknowledgment one of the foremost biologists in the world, will be of interest in this connection :

The second principal source for the tuberculous bacilli, namely, tuberculosis of the domestic animals, appears not to have anything like the importance of the phthisic sputum¹. The animals, as is well known, produce no sputum, so that during their life no tuberculous bacilli get from them into the outer world by means of the respiratory passages. Also in the excrement of tuberculous animals tuberculous bacilli appear to be only exceptionally present. On the contrary, it is a fact that the milk of tuberculous animals can cause infection. With the exception of this one way, therefore, the tuberculous virus can only have effect after the death of the animal, and can only cause infection by the eating of the meat. Aside from the probably only rarely occurring cases of direct infection, which can follow from coming in contact with tuberculous parts of the flesh of little wounds and exoriations of the skin, the reception of

¹ Human.

the infectious material will result in this case only by means of the organs of digestion, and in accordance with this the first appearances of the disease must first show themselves here. But now primary tuberculosis of the intestines is not at all frequent in proportion to primary lung tuberculosis—indeed, a decidedly rare affection. From this it is to be concluded, that the infection in question does not often occur from eating the flesh of tuberculous animals. Probably it would occur frequently if the visibly diseased parts of the flesh were not put aside, as is usually the case, and if as is almost invariably the case, the meat were not eaten cooked. Also especially it must be considered that the tuberculosis eatable animals, especially the *perlsucht*¹ of cattle, remains more or less localized, so that after all only the use of the tuberculously altered lungs, glands, etc., would be dangerous. That, nevertheless, the infection from the intestinal canal is indeed possible, is proved by the frequent cases of secondary intestinal tuberculosis of consumptives, which must be attributed to the swallowing of their own sputa. It is, to be sure, strange that, although it is to be supposed, that every consumptive swallows more or less of the tuberculous bacilli-bearing secretion from his lungs, nevertheless intestinal abscesses are not to be found in all. I explain this in the following manner: In the first place, the intestines appear to offer a still more unfavorable point of attack for the slowly growing tuberculous bacilli than the lungs. But further, the feeding-attempts with anthrax bacilli and their spores, have taught that anthrax bacilli, which contain no spores, are destroyed in the stomach, while the spores of these bacilli are able to pass through the stomach unharmed. On that account only, spore-bearing substances can cause infection from the intestinal canal. The tuberculous bacilli will conduct themselves most probably in this regard, like the anthrax-bacilli, and only in case they are provided with spores will cause tuberculosis of the intestines, provided they do not go through the intestinal canal too quickly to render their germinating and establishing themselves at any point of the mucous membrane of the intestines possible. Just the same holds, of course, for the danger of an infection from tuberculous meat, and this circumstance may explain the relatively rare infection from the use of such meat.

The same conditions hold for infection from the milk of cows suffering from *perlsucht*¹. Before all things, if infection is to take place it is necessary that the milk contain tuberculous bacilli. But this appears only to be the case when the milk-glands themselves are tuberculously diseased. But since *perlsucht*-knots do not often occur in the udder, the milk of *perlsucht* cows will often possess no infectious properties. This explains immediately the contradictions in the statements of the various authors, who have made feeding attempts with milk from cows suffering from *perlsucht*. The one set maintain that they have gained positive results, and their statements are of such a sort that it is impossible to doubt the correctness of their observations. The others, on the contrary, could obtain no infection in the animals experimented with. This result is also correct. The positive results were then obtained from milk which accidentally contained tuberculous bacilli, the negative with milk which was free from bacilli.

¹ Bovine tuberculosis.

If infection from tuberculous domestic animals in general does not appear to be frequent, it must by no means be under-rated. Perlucht of cattle and the caseous changes in the lymph-glands of pigs are of so frequent occurrence that they deserve close attention. If, now, we follow the tuberculous bacilli which have got into the lungs by inhalation, into the skin by wounds, into the intestinal canal by swallowing, in their further conduct in the body, we see that they often remain for a long time—sometimes even permanently—in the place of their first establishment. From herds¹ of epithelioid cells they form little knots which enclose giant cells, and regularly from the centre out, fall victims to coagulation-necrosis. The appearances which are conditioned upon the gradual growth of such a herd, and the regressive changes which always keep step with it, have been described in detail in a former section. The first sign of the spreading of the tuberculous process into the neighboring region is the formation of similar knots in the neighborhood of the primary herd. The way, also, in which the migration of the bacilli from the first herd to the place where the secondary knots arise, is to be conceived, I have also already suggested. The following appears to me to be the simplest explanation of this proceeding. The tuberculous bacilli, since they possess no motion of their own, can only be moved along by elements possessing the power of motion, or by currents of liquid. But since the tuberculous knots have no *vasal*² and one cannot see how other liquids, which are in motion can get into the tuberculous herd and sweep away bacilli from them, nothing remains but the wandering cells, which according to experience, act the same part in other disease-producing bacteria, which those elements perform, that provide for the transport of the bacilli. The cell, laden with a bacillus only goes on until, under the influence of the parasite, it loses its power of motion. On the spot where the cell came to a stand-still a new tuberculous knot must arise. In this manner groups of tubercles form, which melt, perish, and cause destruction in the well-known manner.

With the supposition that the wandering cells may be the bearers of the bacilli, we see in the most natural manner the connection with the farther excursions which the tuberculosis bacilli make in the body in almost all cases. When the wandering cell moves in the tissue-passages and must rely on its own power of motion, then the distance which it travels is only a short one and the newly arising infectious herd must lie in the neighborhood of the point of departure. But as soon as the wandering cells move in the lymph-vessel and the lymph-stream comes to their help in their movement, then they travel greater distances, as is seen not seldom, in the tubercles spreading themselves out in the course of the lymph-vessels. But very often then the tuberculous bacilli are swept away still farther in the lymph-vessels and led into the nearest lymph-glands, where in like manner as in the first place of infection they call forth the formation of knots and caseous degeneration. The changes conditioned upon this in the gland-tissue appear usually to hinder a further progress of the bacilli by the way of lymph-passages. But by this no insurmountable barrier is placed in the way of the progress of the bacilli. They can, under special conditions, get into the stream of the blood. This happens when, as Ponfick has shown, the tuberculosis attacks the thoracic duct, and reaches the interior of the same ;

¹ Collections or clusters. ² Outlet or inlet vessel.

the tuberculous bacilli are then led direct from the lymph-stream into the blood-stream.

* * * * *

The relation is similar between the tuberculosis of animals, above all of *perlsucht*, and tuberculosis in man. These also must, on account of the identity of the parasites on which they are conditioned, be held to be identical with human tuberculosis in spite of the differences in the anatomical behavior and in their clinical course. It has, to be sure, been stated, especially with reference to *perlsucht*, that the transmission of this disease to man has not yet been certainly proved. On the other hand the following may be said: On account of the very slow development of the disease, the place and time of the infection and therewith the source of the same can no longer be confidently stated, when the first plain symptoms appear. On this account in the frequent inhalation-tuberculosis the mode of infection can be determined in a scientific manner only in comparatively few cases. Still less will this be possible in the much rarer cases of intestinal tuberculosis arising from the use of flesh or milk of cattle suffering from *perlsucht*, because here the uncertainty is heightened by the easily possible confusion with other much more frequent kinds of infection. It is therefore very questionable whether ever a case of human tuberculosis can without criticism be attributed to the use of the meat or milk of tuberculous animals. But if one thinks, that to the most various sorts of animals (cats, rabbits, guinea pigs, field mice) by inoculation with masses of *perlsucht* and the pure cultures gained from them, a disease can be generated with the greatest regularity which anatomically is exactly like the disease caused by inoculation with tuberculous masses, and which kills the animals with the same certainty as the last, then it is not to be expected that man should be an exception to this disease-poison. If in the course of further investigations again a difference between the *perlsucht* and the tuberculous bacilli should show itself, which would compel us to consider the same as only near relations, we should even then have all cause to hold the *perlsucht* bacilli as suspicious in the highest degree. From the hygienic standpoint the same measures must be taken against it as against the infection through tuberculous bacilli, so long as it is not proved that man can bring *perlsucht* bacilli in contact with skin-wounds without danger, that he can inhale the same or bring their spores into his intestinal canal without becoming tuberculous.

So far as is known to this department, the disease among cattle has not increased in number of cases in Rhode Island during the past year. There is, however, no probability that the number has decreased in any large measure, although the knowledge of the means by which the disease may be lessened or prevented, is much more largely disseminated than at any previous time.

The Report upon Tuberculosis, a 38 page pamphlet, prepared by the Secretary by request, and presented to the General Assembly at the January Session of 1889, has been quite freely distributed

throughout the State. The final pages of that report may very properly be re-printed in this connection :

CONCLUSIONS.

A consideration of the opinions of eminent veterinarians presented in the foregoing pages, and the results of personal inquiry and personal observations, seem to warrant the following propositions :

a. Tuberculosis is the most extensively distributed and most destructive disease now extant upon the earth.

b. Mankind and the lower animals are alike the victims of the disease.

c. Mankind and the brute creation are alike more largely susceptible to, and proportionately more frequently the victims of, the disease, under the circumstances of advanced civilization.

d. Tuberculosis is communicable from animal to animal and from the lower animals to mankind, and *vice versa*, under all conditions of existence.

e. The disease is communicable from animals to man usually by means of uncooked or partially cooked flesh and milk ; from man to animals by the ingestion of the sputum of a consumptive person.

f. Tuberculosis is communicated from one animal to another by means of the ingestion of milk, or of the sputum or expectoration of an animal so diseased, or may be transmitted by heredity, and possibly by the inhalation of the breath of an animal affected with pulmonary tuberculosis.

g. A tuberculous animal, if introduced into a herd of healthy cattle, will often affect the whole herd sooner or later.

h. A healthy animal introduced into a herd of tuberculous cattle, will, usually, sooner or later, become affected with the same disease.

i. Tuberculosis may therefore be hereditary or infectious. The progeny of animals, so diseased, will sometimes show an incipient development at the time of birth, and at varying periods of a few weeks or months thereafter.

j. The specific cause or agent, (the bacillus tuberculosis), may remain dormant in the progeny of tuberculous animals for several years under circumstances and surroundings favorable to the best health and most vigorous functional activity of the animal.

k. Close confinement in a very warm atmosphere, imperfect ventilation, lack of proper exercise in the open air, too early and too frequent breeding, the interbreeding of animals hereditarily predisposed, and too free use of stimulating or fermenting food, the forcing methods for the greatest production of milk, deprivation of a sufficient amount of healthful food ; in short, whatever lowers the tone of the vital powers, promotes the development of tuberculosis.

l. Usually the first noticeable symptoms are, a short dry cough, (in occasional cases no cough occurs until the disease has reached an advanced stage), a shortness of breathing upon being hurried, tendency to premature birth or early dropping of offspring, swelling of the joints attended with lameness, nymphomania in cows ; but an early positive diagnosis is in many cases impracticable in the living animal.

m. A positive diagnosis can be reached in the more advanced stages of the disease, when tubercular matter can be obtained and the inoculation of healthy animals therewith be resorted to.

n. In the later stages the rational symptoms, loss of flesh, unthriftiness of appearance, diminution and thinning of the milk, difficult breathing attended with cough, and especially if there is present any enlargement or tenderness of the udder, will declare the disease; and the milk of such animals can not be used with safety.

o. Upon the appearance of the earliest symptoms of tuberculosis every cattle owner, for the public safety and his personal interest, should secure an examination of the animal by a competent veterinarian, and if the case is suspicious only, the animal should be isolated until a positive diagnosis can be made.

p. When an animal has been found affected with confirmed tuberculosis, public safety requires that such animal should be destroyed, and that those animals exposed to its infection, should be quarantined and watched.

q. The presence of tuberculosis among the bovine animals of Rhode Island, is a menace to the public health and prosperity of the State, and the General Assembly should provide compensation for the owners of such cattle as are destroyed to prevent the spread of such disease, not only among cattle but among the citizens of the State.

r. Facts already known seem to warrant the assumption, that not less than five in every one hundred of the milch cows in the State, above five years of age, are affected in some degree with tuberculosis.

s. The disease is much less liable to be communicated during the earlier stages, either by the milk or otherwise, the liability at all times depending largely upon the part of the body in which or upon which the tubercles are situated.

t. Immunity from the infection of tuberculosis through the use of flesh as food, may be secured by thorough cooking; and the milk of cows, by a half hour's boiling, may also be made safe for use as food.

Respectfully submitted,

CHAS. H. FISHER, *Secretary.*

SECRETARY'S REPORT.

HEALTH IN THE TOWNS.

1889.

HEALTH OF TOWNS.

PHYSICIANS' REPORTS.

In order to present, from year to year, a connected history of the comparative prevalence of zymotic and other important diseases, and especially of epidemics, it has seemed necessary that there should be given an account of the diseases occurring in the different towns during each year, that is, as to amount of general sickness, the kinds, relative number compared with other years, general severity, season of occurrence, and locality of special prevalence; and also other facts in relation to the sanitary sentiment of the communities, and suspected sources of ill health.

Therefore, as in previous years, the plan of soliciting from the regular medical correspondents of the Board, and other physicians, a report at the commencement of each year, covering, in a general way, the whole of the preceding year, in relation to the amount of sickness of all kinds, the prevalence of particular diseases, and the sanitary conditions and movements in their respective localities, has been continued, and the circular presented on the following page sent therefor:

OFFICE OF SECRETARY OF THE STATE BOARD OF HEALTH.

PROVIDENCE, Jan. 1, 1890.

The Secretary of the State Board of Health desires to obtain from respectable physicians, actively engaged in the practice of their profession, in every section of the State, an Annual Report covering the whole twelve months preceding the above date.

The following questions will indicate the information sought, and the general plan of such report; but correspondents need not be confined to precise replies to the questions presented, all the freedom being allowable of such modifications and additions as the circumstances or peculiarities of each locality may seem to warrant.

These annual reports are desired for the purpose of presenting the status of the public health, and the sanitary conditions and sentiment existing in the different sections of the State, during the year 1889, in the Twelfth Annual Report of the State Board of Health.

They should be returned to the Secretary of the Board by the second week in February.

Any additional postage stamps needed to cover postage on more extended consideration of the topics suggested, or any other topic having relation to the public health, will be immediately refunded on the receipt of papers.

QUESTIONS.

1. Name of physician.
2. Name of town and circuit.
3. Taking sickness of all kinds, has there been more or less than usual in your circuit the past year? How much?
4. Which of the following zymotic diseases have prevailed in your circuit during the past year? Please state when sporadic and when epidemic, whether mild, average or severe, and in what months they occurred, and in what localities.

	Sporadic or Epidemic.	Degree of Severity.	Months.	Locality.
a. Cholera Infantum.				
b. Croup.				
c. Diarrhœa and Dysentery.				
d. Diphtheria.				
e. Fever, Malarial.				
f. Fever, Typhoid.				
g. Measles.				
h. Scarlatina.				
i. Small Pox.				
j. Whooping Cough.				
5. Any other zymotic disease epidemic.				

OTHER DISEASES NOT SPECIALLY ZYMOTIC.

Also, please state what degree of prevalence, whether large, average or small, and if above average, in what months was the large occurrence of the following named diseases. State degree of prevalence, and time of occurrence, under the headings following :

	Degree of	
	PREVALENCE.	MONTHS.
k. Brain, Inflammation and Congestion of.		
l. Bronchitis, Acute.		

m. Meningitis, Cerebro Spinal, Sporadic.

n. Pneumonia.

o. Rheumatism.

p. Stomach, Acute Diseases of.

6. What diseases, not classed as zymotics, have had unusually large prevalence during the past year ?

7. What diseases have been attended with unusual fatality ?

8. Have any circumstances occurred within your observation or knowledge that seemed to indicate that Scarlet Fever, Diphtheria, or Typhoid Fever had been taken or communicated from one person to another ? A full history of known facts, in detail, should be given. Such history need not be confined to any particular year. State on separate sheet.

9. Has there been, in your opinion, any advance in public sentiment, or views of individuals, in your circuit, in regard to the importance of sanitary surroundings, or any increased interest in means of preventing diseases ? State what reasons for belief.

Very respectfully,

CHAS. H. FISHER,

Sec. of State Board of Health.

The following extract from the Public Statutes, in relation to the duties of town and local boards of health, and practicing physicians, was also appended :

PUBLIC STATUTES, CHAPTER 83.

SEC. 6. The secretary of the said board shall make inquiry, from time to time, of the clerks of town and local boards of health, and PRACTICING PHYSICIANS, in relation to the prevalence of any disease, or knowledge of any known or generally believed source of disease, or causes of general ill health, and also in relation to the proceedings of the said boards of health, in respect to acts for the promotion and protection of the public health, and also in relation to diseases among domestic animals in their several towns and localities respectively,

and the said clerks of town and local boards of health, and the said PRACTICING PHYSICIANS shall give such information, in reply to said inquiries, of such facts and circumstances as shall have come to their knowledge.

REPLIES.

The reports, on the following pages, received from local correspondents and others of the medical profession in the several cities, towns and villages of the State, will give a good representation of the general status of the public health during the year 1889, as to the presence or absence of epidemics or endemics, or large prevalence of important or unusual diseases in the several locations, the sanitary conditions and improvements, if any, in their several circuits, and other suggestions in response to the preceding circular :

ANNUAL REPORTS OF MEDICAL CORRESPONDENTS.

BRISTOL COUNTY.

2. BRISTOL.

3. Taking sickness of all kinds, the general amount has been probably 25 per cent. less than usual.

Diseases have prevailed as follows :

Cholera Infantum. Scarcely any.

Diarrhœa and Dysentery. Sporadic. Mild. August and September.

Fever, Malarial. None indigenous.

Fever, Typhoid. Sporadic. Mild. September and October.

Whooping Cough. Epidemic. Average severity. July, August, September.

No diseases confined to any particular localities.

5. No zymotic disease epidemic, except Whooping cough.

Bronchitis, Acute. Average prevalence. February, March, April.

Pneumonia. Small prevalence. May and October.

Rheumatism. Small prevalence. August.

Stomach, Acute Diseases of. Very few.

6. No disease had unusually large prevalence during the year, except Whooping Cough.

7. No diseases have been attended with unusual fatality.

9. As to any advance in public sentiment, or views of individuals, in regard to increased interest in means of preventing diseases, I learn, from conversation with private persons, that there is an increasing appreciation of the importance of good sanitary surroundings. One street in this town sewered by private parties.

10. I know of no source of ill health in my circuit, other than the close approximation of wells to privy vaults, cesspools, etc.

H. S. SWAN, M. D.

2. WARREN, BARRINGTON.

3. Taking sickness of all kinds, there has been 25 per cent. more than usual in my circuit, during the past year.

4. The following zymotic diseases have prevailed :

Cholera Infantum. Sporadic. Mild. Summer. No. Warren.

Croup. Much less than usual

Diarrhœa and Dysentery. Sporadic. Mild. Summer. Not localized.

Diphtheria. Sporadic. Mild. Fall. Not localized.

Fever, Malarial. Sporadic. Milder. Fall and spring. Not localized. None in Warren.

Fever, Typhoid. Sporadic. Severe. Fall. Manufacturing blocks.

Measles. Sporadic. Severe. Fall. General.

5. No zymotic disease epidemic.

Diseases not zymotic :

Brain, Inflammation and Congestion of. Mild. Occasional.

Bronchitis, Acute. Excessive amount. Winter.

Pneumonia. Rather above the usual amount.

Rheumatism. Less than former years.

6. No other diseases had unusually large prevalence.

7. No diseases attended with unusual fatality.

9. A health officer, appointed by the town council, has been an efficient aid in doing away with unsanitary conditions.

10. No generally believed source of ill health in my circuit.

G. L. CHURCH, M. D.

KENT COUNTY.

2. COVENTRY AND WARWICK, RIVER POINT AND VICINITY.

3. There has been about the average amount of sickness, taking all kinds. Less during the summer months.

4. The following zymotic diseases have prevailed during the year :

Cholera Infantum. About the usual amount. Summer.

Croup. A few cases.

Diarrhœa and Dysentery. Usual amount. Fall and summer.

Diphtheria. Less than usual.

Fever, Malarial. Less.

Fever, Typhoid. About the same as last year.

Measles. Epidemic. Summer and fall. Warwick.

Scarlatina. Not so much as last year.

Whooping cough. Quite prevalent. Early in the year.

5. No other zymotic disease epidemic.

Other diseases :

Bronchitis, Acute. Usual amount. „Cool months.

Pneumonia. Usual amount.

Rheumatism. Increase during summer and fall.

6. Influenza (la Grippe) commenced the last two weeks in December, and attacked nearly two thirds of the inhabitants through the Pawtuxet Valley. The disease itself was not fatal in its character, but its effects were quite serious. The epidemic at the present time is abating rapidly (January 27, '90).

9. Some advance in public sentiment has been made in regard to the importance of sanitary surroundings. Complaints are continually being made in regard to cesspools and vaults, and the owners show commendable activity in abating the nuisances.

10. No generally believed source of ill health in this circuit.

A. G. SPRAGUE, M. D.

2. COVENTRY and portions of adjoining towns.

3. Taking sickness of all kinds, the general amount during the past year, with me, has been more than the average.

4. The following zymotic diseases have prevailed :

Cholera Infantum. Sporadic. Average. June. Quidnick.

Croup. Sporadic. Severe. February. Washington.

Diarrhœa and Dysentery. Sporadic. Mild. July, August and September. In villages.

Diphtheria. Sporadic. Average. October, September. Anthony and Washington.

Fever, Malarial. None, except visitors from abroad, occasionally.

Fever, Typhoid. Sporadic. Average. August and September. Washington. One case only, but a genuine one. Every precaution taken to prevent its sprcading. (Continued 34 days.)

Measles. None, except the German variety, which was epidemic in the spring and summer months throughout this vicinity.

Scarlatina. Sporadic on Weaver Hill, where it went from Washington, in spring of 1888. Subsided through summer months. Broke out anew in the fall of 1888. Then subsided again. But in October, 1889, appeared again on north side of the hill, in an isolated house where none of the inmates had exposure of any kind whatsoever that could be learned. Whole family had it thoroughly and made good recoveries. No admission to house was allowed, and there have been no new cases.

Whooping Cough. None.

5. No zymotic disease epidemic.

Other diseases :

Brain, Inflammation and Congestion of. An occasional case throughout the year.

Bronchitis, Acute. Large prevalence. October and November.

Pneumonia. Large prevalence at Noose Neck Hill, in March and April. More than average, in October, November, December, throughout the circuit.

Rheumatism. About the average. Some severe cases.

Stomach, Acute, diseases of. But few cases, in summer.

6. Bronchitis and Pneumonia had a rather large prevalence during the past year.

7. No diseases have been attended with unusual fatality.

8. As to circumstances within my observation or knowledge that seemed to indicate that Scarlet Fever, Diphtheria and Typhoid Fever had been taken or communicated from one person to another, I have long been satisfied that they are communicable. Have plenty of evidences, but no *new* kind of evidence worth repeating.

9. As to any advance in public sentiment in regard to increased interest in means of preventing disease, I may say I hope there has been, but improvement goes very slowly.

10. No generally believed source of ill health in this circuit, but some cases of ill constructed sink drains do probably cause disease.

F. B. SMITH, M. D.

2. EAST GREENWICH AND PARTS OF WARWICK AND NORTH KINGSTOWN.

3. There has been the usual amount of general sickness during the last year. The following zymotic diseases have prevailed :

Cholera Infantum. Sporadic. Generally mild. Summer and autumn. Village, mostly.

Croup. Sporadic. Severe. Spring. Village, mostly.

Diarrhœa and Dysentery. Sporadic. Not severe.

Diphtheria. Sporadic. Mild.

Fever, Typhoid. Sporadic. Mild. Autumn. Village and country.

Measles. Sporadic. Mild. December. Country.

Scarlatina. Sporadic. Not many cases, but some severe and fatal. September, October. Village.

Other diseases not zymotic :

Bronchitis, Acute. Quite prevalent. November and December.

Pneumonia. Occasional cases all through the year.

Rheumatism. Not much.

6. Organic Disease of Heart, with resultant effusion.

8. Scarlet Fever, as it has prevailed this year, has been in families, not spreading outside, although no great precautions were taken to prevent it.

9. Not very much advance in sanitary sentiment observable.

10. No especial source of ill-health known.

J. H. ELDRIDGE, M. D.

2. WARWICK AND COVENTRY.

3. Taking sickness of all kinds, the general amount has been rather less than usual during the past year.

4. The following zymotic diseases have prevailed :

Cholera Infantum. Sporadic. Mild. Summer.

Diarrhœa and Dysentery. Sporadic. Severe. November, December.

Diphtheria. Sporadic. Mild.

Fever, Malarial. Small number. Mild.

Fever, Typhoid. Few cases. Mild.

Measles. Epidemic. Mild. November and December.

Whooping Cough. Epidemic. Severe. September.

5. Influenza or La Grippe. Epidemic. December. Mild.

Other diseases :

Pneumonia. No unusual number.

Rheumatism. About as usual.

6. No other diseases had unusually large prevalence during the year.

7. None attended with unusual fatality.

9. I see no advance in public sentiment, or views of individuals, in regard to the importance of sanitary surroundings.

10. No generally believed source of ill health in my circuit.

J. WINSOR, M. D.

NEWPORT COUNTY.

2. NEWPORT, MIDDLETOWN and JAMESTOWN.

3. The general amount of sickness, including all kinds during the past year, about the average, with less zymotic disease, 48 deaths having occurred, against, I think, 68 last year.

4. The following zymotic diseases have prevailed during the year.

Cholera Infantum. Sporadic. Moderate. July, August, September. Principally in thickly settled and poor localities.

Croup. Less than usual.

Diarrhœa and Dysentery. Dysentery almost epidemic. Severe. September. All about the city, but principally in unsanitary localities.

Diphtheria. Less than usual. Spring months.

Fever, Malarial, alone.

Fever, Typhoid. Less than usual, except that 13 cases, causing five deaths, came from U. S. T. S. New Hampshire. Average severity. August, September and October. 23 cases originating in the city, from all quarters.

Measles. Three cases only in city reported; two of them were imported. Mild.

Scarlatina. 16 cases only, with one death. Mild.

Whooping Cough. Small number.

5. No zymotic disease epidemic, except a very unusual amount of dysentery in the late summer ; probably caused by the extreme moisture ; constant rain.

Other diseases :

Brain, Inflammation and Congestion of. Average number.

Bronchitis, Acute. Usual amount. Cool months.

Pneumonia. Average. Spring months.

Rheumatism. Average. Mostly spring months.

Stomach, Acute Diseases of. Average number.

6. No disease had unusually large prevalence during the year, except dysentery.

7. None attended with unusual fatality.

8. In regard to facts that seemed to indicate that Scarlet Fever, Diphtheria, and Typhoid Fever are communicable from one person to another, do not doubt communicability of Scarlet Fever and Diphtheria, and think Typhoid Fever contagious, but not to the degree that the others are.

9. Believe a constant advance is made in the belief in the necessity for local boards of health, and in the acquiescence to their demands.

10. No well known or generally believed source of ill health in this city.

H. E. TURNER, M. D.

2. TIVERTON.

3. Taking sickness of all kinds, the general amount has been about as usual during the past year.

4. The following zymotic diseases have prevailed :

Diarrhœa and Dysentery. Sporadic. Severe. August.

Diphtheria. Sporadic. Mild. October.

Fever, Malarial. Sporadic. Mild. August.

Fever, Typhoid. Sporadic. Mild. September.

Measles. Sporadic. Mild. May.

Scarlatina. Sporadic. Mild. April. No particular locality.

5. No zymotic disease epidemic.

6. No diseases had unusually large prevalence during the year.

7. None attended with unusual fatality.

C. H. YALE, M. D.

PROVIDENCE COUNTY.

2. CUMBERLAND and LINCOLN, LONSDALE and vicinity.
3. Including sickness of all kinds, the general amount has been rather less than usual during the past year.
4. The following zymotic diseases have prevailed during the year :
 Cholera Infantum. Sporadic. Mild. Summer. Villages.
 Croup. Sporadic. Severe. Autumn. Villages. Chiefly associated with Diphtheria.
 Diarrhœa and Dysentery. Sporadic. Average. Summer and Autumn.
 Diphtheria. Epidemic. Mild. Autumn. Lonsdale. Marked cases of the disease covering tonsils and often extending beyond ; but, except when Croup supervened, very answerable to treatment.
 Fever, Malarial. Epidemic. Mild. April to November. Everywhere. Less Intermitent Fever than last year ; less last year than in 1887, when the disease in Lonsdale and Berkeley reached its height.
 Fever, Typhoid. Sporadic. Prolonged. Summer and Autumn. Village and country.
 Measles. Sporadic. Mild. Winter. Village and country.
 Scarlatina. Sporadic. Mild.
 Whooping Cough. Epidemic. Severe. Autumn. Berkeley.
5. Epidemic Influenza began in December. At first scattered cases, soon followed by a multitude, amounting in all to a majority of the population. Cases in adults more protracted than in children as a rule. Indications of contagiousness.
- Other diseases :
 Bronchitis, Acute. About as usual.
 Pneumonia. Spring and early summer. Seemingly epidemic. All Croupous Pneumonia, especially in children. Few fatal.
6. Of diseases that had unusually large prevalence, see question letters, d, l, j, and question 5.
7. No unusual fatality.

L. F. C. GARVIN, M. D.

2. VALLEY FALLS, LINCOLN and CUMBERLAND.
3. Taking sickness of all kinds during the past year, there was about the average amount.
4. Zymotic diseases prevailed as below during the year :
 Cholera Infantum. Sporadic. Mild. Summer.
 Diarrhœa and Dysentery. Sporadic. Mild. Summer and Fall.
 Diphtheria. Sporadic. Mild.
 Fever, Malarial. Sporadic. Mild. April to November.
 Fever, Typhoid. Sporadic. Mild. October.

Whooping Cough. Sporadic. Mild. November and December.

Influenza. Epidemic. December.

Other diseases :

Bronchitis, Acute. Moderate prevalence. March, April, October and November.

Pneumonia. Moderate prevalence. February and March.

Rheumatism. Moderate prevalence. March, April and May.

Stomach, Acute diseases of. Small prevalence. October and November.

6. No diseases had unusually large prevalence during the past year except the Influenza.

7. No unusual fatality.

8. Nothing new occurred within my observation that seemed to indicate that Scarlet Fever, Diphtheria, or Typhoid Fever had been taken or communicated from one person to another.

9. No apparent advance in public sentiment in my circuit, in regard to increased interest in means of preventing diseases.

10. Have no knowledge of any generally believed source of ill-health in my circuit.

G. B. HAINES, M. D.

2. GLOCESTER and vicinity.

3. Taking sickness of all kinds, there has been the usual amount in this circuit during the past year.

4. The following zymotic diseases have prevailed during the year :

Cholera Infantum. Sporadic. Severe. Summer. Near Mapleville.

Croup. Sporadic. Severe. November. In a small cabin in the woods, three miles west of the village of Chepachet.

Diarrhœa and Dysentery. Sporadic. Average severity. Summer and Fall.

Diphtheria. Sporadic. Average severity. Throughout year. Outside the village.

Fever, Malarial. None but imported cases.

Fever, Typhoid. Sporadic. Mild. September and October.

Measles. Epidemic. Mild. November and December. Around Harmony.

Whooping Cough. Epidemic. Average severity. January to October. Chepachet and vicinity.

5. "La Grippe" or Influenza. December.

Other diseases :

Brain, Inflammation and Congestion of. Small prevalence. December.

Bronchitis, Acute. Average prevalence. Throughout year.

Pneumonia. Small prevalence. Beginning and close of year.

Rheumatism. Small prevalence. All seasons.

Stomach, Acute diseases of. Small prevalence.

6. No diseases had unusually large prevalence except as stated above.

7. No diseases attended with unusual fatality.

8. Nothing new that seemed to indicate that Scarlet Fever, Diphtheria, or Typhoid Fever had been taken or communicated from one person to another.

9. Do not see any advance in public sentiment in regard to the importance of sanitary surroundings.

10. No known special source of ill-health in this circuit.

G. A. HARRIS, M. D.

2. SMITHFIELD, GREENVILLE CIRCUIT and parts of adjoining towns.

3. Taking sickness of all kinds, there has been at least one-third more sickness than usual during the past year in my circuit.

4. The following zymotic diseases have prevailed during the year :

Cholera Infantum. Very little. Sporadic. Average severity. Usual season.

Croup. Few cases. Sporadic. Severe. Fall.

Diarrhœa and Dysentery. Diarrhœa—very prevalent nearly every Summer and Fall month. Dysentery—Epidemic. Very severe. August and September.

Diphtheria. Very little. Average severity. Spring.

Fever, Malarial. Not so much as last year. Average. Summer and Fall.

Measles. Epidemic. Severe. Fall and Winter.

Whooping Cough. Average. Mild severity.

5. No other zymotic disease epidemic, with the exception of the prevailing epidemic of so called Influenza, or "Grippe," which has visited nearly every family in my circuit, and in very many cases been *very* severe. December.

Other diseases :

Brain. Inflammation and Congestion of. Average number and severity. Spring and Fall.

Bronchitis, Acute. Large number. Average. Spring and Fall.

Pneumonia. Small number. Average. Fall.

Rheumatism, Acute. Average number. Quite severe. Summer.

Stomach, Acute diseases of. Average number and severity. Summer and Fall.

6. No other diseases have had unusually large prevalence.

7. No diseases have been attended with unusual fatality.

8. No noticeable advance in public sentiment in regard to means of preventing disease.

10. No generally believed source of ill-health in this circuit, with the exception of the drains and vaults connected with the tenement houses of the manufacturing companies in nearly every village in the town. They were in bad condition during the warm months.

E. A. BALLOU, M. D.

2. SCITUATE and surrounding towns.

3. Including sickness of all kinds, the general amount has been about an average in my circuit during the past year.

4. Zymotic diseases have prevailed as follows during the year :

Cholera Infantum Sporadic. Average severity. Summer.

Croup. Sporadic. Very little. Spring.

Diarrhoea and Dysentery. Usual amount. Summer and Fall.

Diphtheria. Sporadic. Quite severe. Different dates.

Fever, Malarial. Small amount. Warm season.

Fever, Typhoid. Less than usual. Fall.

Measles. Hardly any.

Scarlatina. None.

Whooping Cough. Moderate number.

5. No zymotic disease epidemic.

Other diseases :

Brain, Inflammation and Congestion of. Two cases only.

Bronchitis, Acute. Prevailed largely in the Spring.

Pneumonia. More than usual. Winter and Spring.

Rheumatism. Average number. All seasons.

Stomach, Acute diseases of. Average number. All seasons.

6. No diseases had unusually large prevalence.

7. No unusual fatality.

9. Advance in public sentiment in regard to the importance of sanitary surroundings not very noticeable. Several nuisances were abated, however, by the authorities.

10. No particular known source of ill-health in my circuit.

W. J. SMITH, M. D.

2. SCITUATE and FOSTER, various villages.

3. Taking sickness of all kinds, there has been about ten per cent. increase during the year.

4. The following zymotic diseases have prevailed during the year :

Cholera Infantum Sporadic. Average severity. July, August and September. Rockland and villages in Scituate.

Croup. Sporadic. Average severity. January. Rockland.

Diarrhœa and Dysentery. Sporadic. Average severity. Fall and Winter months. Chopnist and vicinity.

Diphtheria. Sporadic. Average severity. Winter months. Chopnist.

Fever, Malarial. Sporadic. Average severity. May. Chopnist.

Fever, Typhoid. Sporadic. Average severity. November and December. Rockland and Chopnist.

Measles. Epidemic. Severe. September, October and November. Rockland, Ponagansett, Clayville and Chopnist.

Scarlatina. None.

Whooping Cough. Epidemic. Average. September, October and November. Rockland.

5. Russian Influenza. Severe. 30th of December. Chopnist, Rockland, Ponagansett, Richmond, Hopkins' Mills, Clayville. I had 70 cases between December 30th, 1889, to January 13th, 1890.

Other diseases :

'There was a large number of cases of Scabies in Rockland and Hopkins' Mills during April, May, June and July.

Of Inflammation of Brain. A few cases.

Bronchitis, Acute. More than average number of cases. March, April, November and December.

Pneumonia. Fully an average number of cases. November and December.

Rheumatism. Average number of cases. November, December, March and April.

Stomach, Acute diseases of. An average number of cases. July, August and September.

6. An unusual number of cases of Jaundice in Rockland and vicinity.

7. No unusual fatality.

8. No new or striking facts have occurred in my circuit to prove the communicability of Diphtheria, Scarlet Fever or Typhoid Fever, by means of a contagion.

9. I believe there is an advance in public sentiment in regard to sanitation.

10. I do not know of any known or generally believed source of ill-health in my circuit.

B. ARNOLD, M. D.

2. PROVIDENCE CITY.

3. With sickness of all kinds, the general amount has been about an average during the past year.

4. The following zymotic diseases have prevailed, as stated, during the year :
Cholera Infantum. Sporadic cases. Usual type. Summer.

Croup. Occasional. Average. Cool season.

Diarrhœa and Dysentery. Less than usual. Summer and Fall.

Diphtheria. Sporadic. Average prevalence. Cooler months.

Fever, Malarial. No increase. Sporadic. Summer and Fall.

Fever, Typhoid. Sporadic. Much less than in 1888.

Measles. Large prevalence. Autumn months.

Scarlatina. Very small prevalence. Winter and Fall.

Whooping Cough. Large number. All through the year. Severe as a rule.

5. The Influenza, almost epidemic ; after December 20, mild.

Other diseases :

Brain, Inflammation and Congestion of. Occasional through the year.

Bronchitis, Acute. Large prevalence. Winter and Spring.

Pneumonia. Very large prevalence. Winter and Spring.

Rheumatism. Rather more prevalent than usual. All seasons.

Stomach, Acute diseases of. Average number. Mostly in Summer.

6. No diseases have had unusually large prevalence except as stated.

7. No unusual fatality.

8. No unusual circumstances occurred that seemed to indicate that Scarlet Fever or Diphtheria had been communicated from one person to another.

9. There is evidently an advance in public sentiment and in views of individuals, in this city, in regard to the importance of sanitary surroundings.

P. S. REDFIELD, M. D.

2. PROVIDENCE.

3. Including sickness of all kinds, the general amount has been about as usual during the past year.

4. Important zymotic diseases have prevailed during the year, as follows :

Cholera Infantum. Sporadic. Average severity. General.

Croup. Usual number of cases.

Diarrhoea and Dysentery. Sporadic. Average number and type.

Diphtheria. Occasional cases during Winter and Spring.

Fever, Malarial. Fevers, during the Summer and Fall, frequently were of malarial character.

Fever, Typhoid. Less number of Typhoid than in the previous year.

Measles. Of increasing prevalence during the year. Epidemic in November and December.

Scarlatina. Few cases only.

Whooping Cough. Prevalent and of unusual severity.

5. Influenza became epidemic during the last week of the year.

Other diseases :

Bronchitis, Acute. Very prevalent, especially in February, March, April, November and December.

Pneumonia. Quite prevalent. January to May.

Rheumatism. Average number. All seasons.

6. No diseases, except as noticed, had unusual large prevalence during the year.

7. No very unusual fatality.

8. Nothing new that seemed to indicate that Scarlet Fever or Diphtheria had been communicated from one person to another.

G. D. HERSEY, M. D.

2. WOONSOCKET and vicinity.

3. With sickness of all kinds, the general amount has been more than usual during the past year.

4. Zymotic diseases have prevailed during the year, as follows :

Croup. Average number. Average severity. Cool months.

Diarrhœa and Dysentery. Average number. Average severity.

Diphtheria. Epidemic. Mild.

Fever, Malarial. Less number. Mild. All about.

Fever, Typhoid. Average number. Mild.

Measles. Average number. Mild.

Scarlatina. Epidemic. Mild.

Whooping Cough. Epidemic. Mild.

5. No other zymotic disease epidemic.

Other diseases :

Bronchitis, Acute. Average number. Spring.

Pneumonia. Average number. Fall.

Rheumatism. Average number. All times of year.

6. No other diseases had unusually large prevalence.

7. Pneumonia has been attended with unusual fatality.

8. Repeated circumstances have occurred within my observation that seemed to indicate that Scarlet Fever and Diphtheria had been communicated from one person to another.

9. There is an evident advance in public sentiment in regard to the importance of sanitary surroundings and interest in means of preventing diseases.

G. W. JENCKES, M. D.

WASHINGTON COUNTY.

2. CHARLESTOWN and RICHMOND.

3. About an average of sickness of all kinds in the general amount during the year.

4. The following zymotic diseases have prevailed during the year :

Diarrhœa. Sporadic. Average. July and August. General.

Diphtheria. See note appended.*

Fever, Typhoid. Sporadic. Mild. September and October. Carolina and vicinity.

Scarlatina. Epidemic. Severe. December. Carolina.

Whooping Cough. Epidemic. Mild. October and November. Kenyon's Mills.

5. No other zymotic disease epidemic.

Other diseases :

Bronchitis, Acute. Small number. October and November.

Pneumonia. Small number. December.

Rheumatism. Average. February and March.

6. No other diseases had unusually large prevalence.

7. No unusual fatality.

8. Circumstances continually occur within my observation that seem to indicate that Scarlet Fever and Diphtheria had been communicated from one person to another.

9. Think there is a better knowledge and application of sanitary laws.

10. No generally believed source of ill-health in my circuit.

A. A. SAUNDERS, M. D.

2. SOUTH KINGSTOWN.

3. Including sickness of all kinds, the general amount has been about an average during the past year.

4. The following zymotic diseases have prevailed :

Cholera Infantum. Sporadic. Average severity. Summer.

Diarrhœa and Dysentery. Sporadic, Average. Summer and Autumn.

Diphtheria. Heard of several. Fatal. November. Usquepaugh.

Fever, Malarial. Sporadic. Mild. All the year.

Fever, Typhoid. Epidemic, almost. Quite severe. Autumn and early Winter. Peacedale and Wakefield.

5. No other zymotic disease epidemic.

* December 2, 1889, Willie McGee, aged three years, was taken with convulsions, and soon developed a severe form of scarlet fever and diphtheria, running its usual course and terminating favorably. Upon the fifth day after the attack, the mother was taken with diphtheria, and the following day the grandmother with the same, both having a severe form of it. They were the only persons exposed, as perfect isolation had been maintained. At this time the grandfather came to care for them—having, in the meantime, sent for a daughter in Boston—and upon the fourth day, he was taken with diphtheria—same severe form. The daughter arrived the day after her father went to the resene, and in four or five days was stricken with scarlet fever and diphtheria, having a very severe time. The father of the child (who had not been at home) arrived after all had partially recovered, and he also had a mild diphtheria. The cases extended over a period of five weeks, all fully recovered, and so well isolated that no other cases have occurred. There had not been a case of scarlet fever in this village in several years, and no diphtheria for several months.

Other diseases :

Bronchitis, Acute. Above average. Spring and Autumn.

Pneumonia. Average number. Cool season.

Rheumatism. Average number. Early Spring and November.

Stomach, Acute diseases of. Average number.

6. Excepting Typhoid Fever, no diseases had unusual large prevalence during the year.

7. No unusual fatality.

9. In regard to any advance in public sentiment as to the importance of sanitary surroundings, can only say that possibly the general community of Wakefield and Peacedale are awakening to need of sewerage, owing to introduction of water works. Sewer system is planned and begun at Narragansett Pier, but not a good system.

10. Lack of proper sewer arrangements in Peacedale and Wakefield causes an unusual amount of Typhoid Fever and, perhaps, Cholera Infantum and Dysentery.

P. K. TAYLOR, M. D.

2. SOUTH KINGSTOWN.

3. Taking sickness of all kinds, the general amount has been more than usual in my circuit during the past year.

4. The following zymotic diseases have prevailed during the year :

Cholera Infantum. Sporadic. Average severity. Summer.

Croup. Sporadic. Average severity. Cool season.

Diarrhœa and Dysentery. Sporadic. Average severity.

Diphtheria. Numerous sporadic cases.

Fever, Malarial. Some cases.

Fever, Typhoid. Considerable. Sporadic. Mild. No particular season.

5. No disease epidemic except La Grippe. December. Wakefield.

Other diseases :

Brain, Inflammation and Congestion of. Small.

La Grippe or Bronchitis, Acute. Large. December.

Pneumonia. Average prevalence. Cool season.

Rheumatism. Average prevalence. Through the year.

Stomach, Acute diseases of. Average prevalence. Summer.

6. No diseases had unusually large prevalence.

7. No unusual fatality.

8. Am familiar with several cases of Diphtheria, which were sporadic ; i. e., every child had it in the family, and none elsewhere.

10. Do not know of any particular source of ill-health.

J. E. PERRY, M. D.

2. NORTH KINGSTOWN.

3. Of all kinds of sickness, the general amount has been about an average during the year.

4. The following zymotic diseases have prevailed during the year :

Cholera Infantum. Sporadic. Mild. September and October.

Croup. Sporadic. Mild. Cold months.

Diarrhœa and Dysentery. Sporadic. Average severity. Summer and Fall.

Fever, Typhoid. Sporadic. Mild. Fall.

Measles. A few mild cases, confined to the families where they occurred. Were from outside infection.

Whooping Cough. Epidemic of average severity during Winter and Spring months of 1889, in most of the villages of the town.

5. No other zymotic disease epidemic.

Other diseases :

Bronchitis, Acute. Average amount. Usual severity. Cool season.

Pneumonia. Average number of cases. Usual severity. Cool season.

Rheumatism. Less than usual.

6. No diseases not mentioned had unusually large prevalence.

7. No unusual fatality.

9. As to any advance in public sentiment in regard to the importance of sanitary surroundings, there is nothing of especial note. I think, however, that people generally are becoming better informed on sanitary subjects, and progress is being quietly and constantly made.

10. No generally believed source of ill-health.

C. E. MARYOTT, M. D.

2. Southern part of HOPKINTON, northern part of WESTERLY.

3. I should think the general amount of sickness had been about an average for the year ; the spring and winter months less ; fall and summer with more.

4. The following zymotic diseases have prevailed during the year :

Cholera Infantum. None to my knowledge ; some reported during July and August, but more probably gastro-intestinal catarrh, as the duration of sickness was from three to five weeks ; general recovery.

Croup. Sporadic. Mild. March, April and November. Ashaway and Potter Hill.

Diarrhœa and Dysentery. Epidemic. Mild. July and August. Potter Hill.

Diphtheria. Sporadic. Mild. All through the year. No particular locality.

Fever, Malarial. Sporadic. Average. Summer and Fall. Mostly imported cases.

Fever, Typhoid. Sporadic. Average. November and December. Middle of town.

Measles. Epidemic. Severe. Spring and Summer. Ashaway and Potter Hill.

Scarlatina. Sporadic. Mild. All through the year. No particular locality.

Whooping Cough. A few cases during late Summer and Fall, in eastern part of town.

5. Mumps. Severe. Summer and Fall. Ashaway and vicinity.

Other diseases :

Bronchitis, Acute. Large number. Spring and Fall.

Pneumonia. Small number. April, May and June.

Rheumatism. Large number. Spring and Summer.

6. No diseases not named had unusually large prevalence during the year.

7. No unusual fatality.

9. Owing to the perversity of our Town Council, the town has been without a Health Officer for the greater part of the year, but they did finally appoint a layman. In one case that came to my knowledge, a man was almost a whole year in getting a most dangerous nuisance abated.

A. B. BRIGGS, M. D.

2. WESTERLY.

3. Taking sickness of all kinds, the general amount was about an average during the past year.

Cholera Infantum. Scarcely any.

Diarrhoea and Dysentery. No more than usual.

Fever, Typhoid. Sporadic. Less than average. Fall.

No zymotic disease epidemic.

Other diseases :

Bronchitis, Acute. Small prevalence. Spring.

Pneumonia. Small prevalence. Winter and Spring.

Rheumatism. Small prevalence. All the year.

6. No diseases had unusually large prevalence during the year.

7. No unusual fatality.

8. I have investigated two cases of scarlet fever in a family, the house of which had the reputation of two former outbreaks, the last occurring five years after the second. Thorough fumigation and cleansing had been pursued. About two weeks previous to the last outbreak, a closet, built of ceiling boards, was removed from one side of a room to the other, when one of the above cases occurred. The question is, were the germs of scarlet fever concealed in the grooves of the boards that length of time and remain active.

10. No generally believed source of ill-health in this town.

H. W. ROSE, M. D.

TOWN SANITATION.

REPORTS FROM TOWNS,

IN RELATION TO SANITARY IMPROVEMENT, ETC.

A complete annual report of a State Board of Health properly includes an account of the measures taken each year by municipal authorities, corporations or individuals, for the promotion of the health of the communities under their respective supervision or control. In order, therefore, to ascertain the facts in relation to such measures, and for the purpose of presentation in this Report, as in the reports heretofore issued, and in the continuance of the design to keep well informed of all proceedings throughout the State, on the part of town or city councils, or any form of municipal authority, in the appointment of health officers or boards of health, in the direction of improvements which have in view and seem to promise the promotion of public health; by the abatement of nuisances; the removal of unsanitary conditions and surroundings; or by the introduction of water for general use; or construction of sewers; or the establishment of other public works, which may not only be of great public utility and convenience, but also serve in some measure, large or small, in the prevention of disease, the Secretary has, as heretofore, solicited replies from the town and city clerks of the several towns and cities, or other municipal officers, in answer to questions proposed in a circular sent for that purpose.

It is designed and hoped that a connected history may thereby be secured of all sanitary improvements of a public character in all parts of the State, from year to year, and the gradual awakening of the citizens of the different towns to the necessity of sanitary public measures shown; and also whatever intelligent appreciation of such necessity, and whatever public spirit in existence in the towns there may be, as manifested by the readiness with which needed sanitary measures are adopted.

The following is the form of circular sent at close of the year 1889:

CIRCULAR No. 108.

OFFICE OF SECRETARY OF THE STATE BOARD OF HEALTH,

48 WEYBOSSET STREET,
PROVIDENCE, R. I., Jan. 1, 1890.*To the Town Clerk:*

It is, by statute law, made the duty of the Secretary of the State Board of Health to make inquiries of town or city clerks, or of the clerks of local boards of health, in regard to the general health and sanitary condition of the towns, and also in regard to measures taken for the improvement of the same.

The law reads as follows :

PUBLIC STATUTES, CHAPTER 83.

SEC. 6. The Secretary of the said Board shall make inquiry, from time to time, of the clerks of town and local boards of health, and practicing physicians, in relation to the prevalence of any disease, or knowledge of any known or generally believed source of disease, or causes of general ill-health, and also in relation to the proceedings of the said boards of health, in respect to acts for the promotion and protection of the public health, and also in relation to diseases among domestic animals, in their several towns and localities, respectively; and the said clerks of town and local boards of health, and said practicing physicians, shall give such information, in reply to said inquiries, of such facts and circumstances as have come to their knowledge.

The Secretary therefore respectfully makes the following inquiries:

1. Has any work for the promotion of public health been contemplated or completed in your town by the town authorities, or by private enterprise, during the year? If any, please state what.

2. If by introduction or extension of water service for general use, please state what proportion of the population, by estimation, was supplied with the same at the end of the year.*

* If not known by the person replying, please state where or of whom such information may be obtained.

3. If by sewage, state what the aggregate length of sewers, by estimation or otherwise, and about what proportion of the population had drainage connection with them at the end of the year.*

4. If by new ordinances in abatement of nuisances, or in improvement in heating or ventilating public buildings, halls, school houses, &c., or by drainage, or by compelling the removal of excreta, garbage, house refuse, &c., or for any sanitary purpose, please give terms and date of enactment of such town ordinance, or send copy of same, also state how far, to your best knowledge, all the sanitary ordinances have been enforced. Copies of town ordinances especially desired.

5. Has your town any legal board of health beside the town council? If so, please give the names of the officers of the same.

6. Please give the names of the health officers of your town.

7. Has gratuitous vaccination been provided in your town during the past year? What proportion of the population was vaccinated, according to your best knowledge?

8. Have undertakers promptly sent in their returns of death? Please give names of any who do not. (See Public Statutes, Chap. 85, Sec. 1.)

Respectfully,

CHAS. H. FISHER,

Sec. State Board of Health.

N. B.—The town or other clerk should charge a remunerative fee for replying to the above circular, and present to the town council or board of health, it being a service required by law.

* If not known by the person replying, please state where or of whom such information may be obtained.

REPORTS FROM TOWN CLERKS

*In relation to the prevalence of disease, and to municipal proceedings
in regard to public sanitary improvements, the
promotion of public health, etc.*

BRISTOL COUNTY.

BARRINGTON.

1. No new work for the promotion of public health by the town authorities during the year.
2. Some extension of water service for private use, supplied from Bristol and Warren water works.
3. No public sewerage.
4. No new ordinances in abatement of nuisances, or for any sanitary purpose.
5. No legal board of health beside the town council.
6. No health officers appointed.
7. No gratuitous vaccination provided during the year.
8. Undertakers have promptly sent in their returns of death.

M. H. WOOD, *Town Clerk.*

BRISTOL.

1. No new work for the promotion of public health by the town authorities, or by private enterprise, during the year, excepting the building of a sewer, about half a mile in length, by private parties.
2. By the extension of water service for general use, about one-third of the population are now supplied.
3. About half a mile of new sewers have been constructed during the last year, as above stated.
4. By action of the town council, three public buildings have been connected with new sewers.
5. No board of health beside the town council.
6. Health Officer, George H. Peck.
7. Gratuitous vaccination has been provided during the past year. The Superintendent of Schools attended to the matter very promptly.
8. Undertakers have promptly sent in their returns of deaths.

H. F. BENNETT, *Town Clerk.*

WARREN.

1. The health officer has carefully inspected premises in the compact part of the town.
2. There has been a slight increase in the water service during the year.
3. There has been no sewer constructed during the year.
4. No new ordinances were adopted having relation to public health.
5. The council is the legal board of health.
6. Health Officer, J. M. Smith.
7. No gratuitous vaccination was provided during the past year.
8. Undertakers have promptly sent in their returns of death.

CHARLES B. MASON, *Town Clerk.*

KENT COUNTY.

COVENTRY.

1. No work for the promotion of public health, except a more general care for the cesspools and house drainage.
2. Introduction of water service for general use contemplated for Anthony and Quidnick villages.
3. No sewerage.
4. Nothing new in abatement of nuisances, or for any sanitary purpose, except as above.
5. Board of Health, John Winsor, M. D., G. Louis Wood, M. D., Charles L. Ormsbee, M. D., and F. B. Smith, M. D.
6. Health officers, same as board of health.
7. No gratuitous vaccination provided during the past year.
8. Generally, undertakers have promptly sent in their returns of death.

S. W. GRIFFIN, *Town Clerk.*

EAST GREENWICH.

1. No particular work for the promotion of public health contemplated by the town authorities.
2. By extension of water service for general use, do not know what proportion of the population was supplied with the same at the end of the year.
3. No public sewerage.
4. No new ordinances in abatement of nuisances or for any sanitary purpose.
5. Board of health, the town council.
6. Health Officer, James H. Eldridge, M. D.

7. Gratuitous vaccination was provided during the past year. Mostly scholars in public schools.

8. Undertakers have promptly sent in their returns of death.

E. STANHOPE, *Town Clerk.*

WEST GREENWICH.

1. Nothing new for the promotion of public health.

2. No water service for general use.

3. No public sewerage.

5. Board of health, the town council.

6. Health Officers, the town council.

7. No gratuitous vaccination provided during the past year.

8. Returns of death have been sent in very promptly, so far as I know.

W. N. SWEET, *Town Clerk.*

WARWICK.

1. No particular work for the promotion of public health by the town authorities.

2. Phenix Water Co.'s reservoir dam broken down by overflowing. South western section of town to be supplied by Warwick and Coventry Water Co.

3. No public sewerage.

4. No action in particular in abatement of nuisances, or for any sanitary purpose.

5. Board of health, the town council.

6. Health Officer, Dr. Albert G. Sprague.

7. Gratuitous vaccination was provided during the past year. As to proportion of the population vaccinated, Dr. J. B. Hanaford, Apponaug, has this data.

8. Undertakers have promptly sent in their returns of death.

J. S. LOCKWOOD, *Town Clerk.*

NEWPORT COUNTY.

JAMESTOWN.

1. Main sewer through the thickly settled portion of the town completed.

2. Water service for general use not yet introduced.

3. About one mile of sewer built.

4. No new ordinances in abatement of nuisances, or for any sanitary purpose, except as stated.

5. Board of health, the town council.

6. Health Officer, Abbott Chandler.

7. Gratuitous vaccination not provided during the past year.
8. Undertakers have promptly sent in their returns of death.

CHAS. E. WEEDEN, *Town Clerk.*

LITTLE COMPTON.

1. No work for the promotion of public health by the town authorities during the year.
2. We have no water service for general use.
3. No public sewerage.
4. There have been no new ordinances during the past year for any sanitary purpose.
5. No legal board of health beside the town council.
6. No appointment of health officer.
7. Gratuitous vaccination has not been provided in this town during the past year.
8. Generally, undertakers have promptly sent in their returns of death.

F. R. BROWNELL, *Town Clerk.*

MIDDLETOWN.

1. No particular work has been begun in Middletown during the year 1889, designed for the promotion or improvement of the sanitary condition of its inhabitants.
2. There was no introduction or extension of water service for general use during the year 1889.
3. Nothing was done in the matter of sewerage. Middletown is not densely populated and no urgent necessity exists for the construction of a system of sewerage.
4. The town council have had under consideration a general sanitary code, but failure to agree upon some of the details thereof, has thus far prevented its adoption.
5. The town council is the only authorized board of health in Middletown.
6. John Peckham is Health Officer, and he has given time and diligent attention to cases of epidemic and contagious diseases and taken proper and effectual means to prevent their spread.
7. The town council did not provide for the free vaccination of the inhabitants of Middletown during 1889.
8. Undertakers for the last two years have been very punctual in forwarding returns of deaths to the town clerk, and the returns are, in most instances, full and complete.

ALBERT L. CHASE, *Town Clerk.*

SANITARY CODE* OF THE TOWN OF MIDDLETOWN, R. I. RULES AND REGULATIONS OF THE BOARD OF HEALTH OF MIDDLETOWN, IN RELATION TO CONTAGIOUS DISEASES AND THE PRESERVATION OF THE PUBLIC HEALTH.

[Adopted January 20, 1890.]

The following recited Rules and Regulations made by the Town Council of the town of Middletown, acting as a Board of Health in and for said town, in pursuance of law, are hereby declared to be the act of said board and shall take effect from and after the twentieth day of January, 1890 :

RULE I. Every physician having knowledge of the existence of any case of cholera, yellow fever, typhus fever, typhoid fever, cerebro-spinal meningitis, diphtheria, small pox, scarlet fever, measles, intermittent fever, or of any other contagious, infectious or epidemic diseases within the town of Middletown, shall immediately make report thereof in writing to the Health Officer of said town, who shall forthwith take all necessary measures to prevent the spread thereof.

RULE II. Any physician who shall be furnished with a copy of this code, and shall neglect or refuse to comply with the requirements of the first rule hereof, shall be fined not less than two, nor more than ten dollars, for each day of such neglect, after having knowledge of the existence of any of the diseases enumerated therein.

RULE III. No person living in a family where there is a case of either of the diseases enumerated in the first rule of this code, shall attend any school, church, or public meeting, nor shall any teacher of a public school knowingly admit any such person thereto, until the Health Officer shall furnish such person with a certificate that the danger of contagion or infection has passed, and that the dwelling-house where such person lives has been properly fumigated.

RULE IV. The certificate mentioned in the preceding rule shall not be furnished until after the elapse of time sufficient, in the judgment of a reputable physician, to show there will be no further cases, and that the peril of contagion has passed.

RULE V. No person having whooping cough, mumps, or chicken pox, shall attend any school or public meeting until complete recovery.

RULE VI. No undertaker shall conduct or allow to be conducted, public funeral ceremonies over the body of any person dying of any of the diseases enumerated in the first rule of this code without special permission from the Health Officer or Town Council, and any undertaker violating the provisions of this rule, shall be fined ten dollars for each offence.

RULE VII. The body of every human being buried within the municipal limits of this town, shall be so buried that the top of the coffin or receptacle containing said body shall be at least three feet below the usual surface of the ground where buried. Whoever buries or inters a body at a less depth without special permission from the Board of Health, shall be fined ten dollars for every such offence.

* This code was adopted after the report of the town clerk was made.

RULE VIII. The Health Officer shall complain of and prosecute to final judgment, all violations of the rules of this code, and shall be entitled to one-half of all the fines recovered by virtue hereof, and the other half he shall pay into the town treasury.

A true copy from the record.

Attest :

ALBERT L. CHASE, *Council Clerk.*

NEW SHOREHAM.

1. Nothing for the promotion of public health by the town authorities.
2. No introduction or extension of water service for general use.
3. No public sewerage.
4. No new ordinances in abatement of nuisances or for any sanitary purpose.
5. The only legal board of health, the town council.
6. Health Officer, Herbert S. Millikin.
8. Undertakers have promptly sent in their returns of death.

A. N. ROSE, *Town Clerk.*

PORTSMOUTH.

1. No work for the promotion of public health in particular.
2. No water service for general use in the town.
3. No public sewers.
4. No new ordinances in abatement of nuisances or for any sanitary purpose.
5. No legal board of health beside the town council.
6. No health officer appointed.
7. Gratuitous vaccination not provided during the past year.
8. As far as I know, undertakers have been quite prompt.

PHILIP B. CHASE, *Town Clerk.*

TIVERTON.

1. No particular work for the promotion of public health contemplated by the town authorities during the year.
2. No water service for general use.
3. No sewerage.
4. No new ordinances in abatement of nuisances or for any sanitary purpose.
5. Board of health, the town council.
6. Health Officers, Peleg D. Humphrey, Samuel E. Borden, Christopher Manchester, Austin Walker and Fernando A. Wilcox
7. Dr. Yale has been engaged to furnish gratuitous vaccination. Work not completed.

8. Generally, undertakers have promptly sent in their returns of death. I do not recall the name of any delinquent.

J. T. COOK, *Town Clerk*.

NEWPORT CITY.

1. Water services have been extended and sewers built by municipal action. A cremator has been put in operation whereby the city garbage has been disposed of by reducing to ashes.

2. See extract from Inaugural of Mayor Coggeshall, appended.

3. See same as above.

5. Newport city has a Board of Health. Members 1889, C. F. Barker, M. D., President; Francis H. Rankin, M. D., Secretary; Henry E. Turner, Jr., Executive Officer.

7. Gratuitous vaccination has been provided.

8. Undertakers have promptly sent in their returns of deaths.

The following extracts from the Inaugural Address, Jan. 6th, 1890, of Hon. Thomas Coggeshall, Mayor of Newport city, are pertinent in this connection :

BOARD OF HEALTH.

In multifarious ways the Board of Health guards the well-being of our city, watchful at all times of the highest interest of our people and zealously reminding the City Council, particularly the Board of Aldermen, of possible or probable danger to the health of Newport. Their statistical record is of exceeding value. Measured by the death rate of other cities and towns, we may properly be grateful to this board for years of fidelity to their responsible duties. We owe it to our permanent and temporary population alike to accept in sanitary matters the advice of this intelligent and wisely conducted board, always our prudent advisers. For a long period the Board of Health urged the Board of Aldermen to provide a method for the better disposition of garbage, etc. During the year just past the appeal was earnestly made, resulting in the building of the cremator on the city wharf. The committee entrusted with its construction reported it to have been properly built, and that the incineration of the garbage was satisfactory. The possible non-conformity to a feature of the contract has not yet been adjusted. When the contract is determined to have been complied with in its building, its cost must be paid from the city treasury.

The purity and abundance of the water supply is a material source of the prosperity of this city. A provision of the contract whereby, when the population of Newport is twenty-five thousand, the cost to the city shall be increased is a matter that your attention is called to, for it may be soon anticipated.

SEWERS.

Sewerage is now recognized as the very important element of health. The system adopted, and successfully tested, demands that further and extensive connections shall be made. Many sewers are too small and in portions of the

city at too low grade : thereby sewage and storm water do not run to the overflow. The surface water should be provided for, the topography of the land determining where the overflow should run, not always safe to be let into the main sewer. Examination in the minutest detail should be made of every part of our sewage system. The districts near Wellington avenue should have attention ; health in many places near it is in peril. It would be the true policy to determine an enlargement of the city's drainage and place it before the people, asking for the needed appropriation by bonds payable in thirty or even fifty years at a low rate of interest.

Work during the year has been done on Channing avenue, a small portion of Gibb's avenue, East Bowery street, a portion of Chastelleux avenue, Webster and Friendship streets, a portion of Beech street, Ocean avenue, Kay street from Mann avenue to Howard avenue, Second, North, Third and Freebody streets. The main sewer has been extended up Lawrence avenue ; pipe sewers have been laid in Dean avenue, Edward and Bridge streets. The street commissioner will recommend that the Wellington avenue overflow be built ; that Coasters Harbor quarry be abandoned ; that a new quarry of better material be purchased or leased ; that new curbs be laid in Kay street, Bellevue avenue and Washington square, and that Long wharf and the pavement in South Thames street be put in order.

PARKS.

The parks of our city are an elevating, helpful and healthy influence ; they have been kept in excellent order during the year. I am grateful that my recommendation concerning Morton Park was regarded. With its development that section of our city, which has long deserved and needed a park, will be provided with an enduring evidence of the generosity of our former beloved townsman, Vice-President Morton. I renew my recommendation of last year, that the area of land at the junction of Thames and Farewell streets be purchased, to be called the Ellery Park, in honor of that patriot, William Ellery, a signer of the Declaration of Independence, our Congressman and the Chief Justice of our State. I recommend that asphalt, stone or granitoid walks be placed in Touro Park. Of Fort Greene, I would make that area a park where the citizens may look upon the delightful entrance to our harbor, risking the very remote probability of the War Department ever reclaiming it. The outlay for grading, strengthening the walks and for seats will not probably exceed \$1,200. There are funds held in trust by the city from which money may be drawn for the adornment of our parks.

PROVIDENCE COUNTY.

BURRILLVILLE.

1. Nothing new for the promotion of public health contemplated by the town authorities.
2. No water service for general use. Private parties talk of introducing water for general use.
3. No sewerage.

4. No new ordinances for sanitary purposes.
5. No legal board of health beside the town council.
6. Health Officer, Herbert F. Mowry.
7. During the past year a physician was appointed to vaccinate school children, and perhaps one hundred children were inoculated.
8. Undertakers quite promptly have sent in their returns of death.

A. MOWRY, *Town Clerk.*

CRANSTON.

1. No work for the promotion of public health by the town authorities during the year.
2. Some extension of water service, but do not know how much.
3. No public sewers.
4. No new ordinances for any sanitary purpose.
5. Board of health, the town council.
6. Health Officers, Dr. F. W. Bradbury, John Bigbee, Town Sergeant.
7. No gratuitous vaccination provided during the past year.

D. D. WATERMAN, *Town Clerk.*

CUMBERLAND.

1. Nothing new for the promotion of public health has been contemplated by the town authorities.
2. For extension of water service for general use, in southwestern part of town, see Pawtucket Water Works Report.
3. No public sewers.
4. No new ordinances have been passed in abatement of nuisances or for any sanitary purpose.
5. No legal board of health beside the town council.
6. Health Officer, Dr. L. F. C. Garvin.
7. Gratuitous vaccination has not been provided during the past year.
8. Undertakers have promptly sent in their returns of death.

P. F. KINION, *Town Clerk.*

EAST PROVIDENCE.

1. No new work for the promotion of public health contemplated by the town authorities.
2. See note appended,* also Report Pawtucket Water Commissioners.

* DR. C. H. FISHER,—Dear Sir: Yours received. On July 1st, 1889, there had been 557 services put in, probably there have been 25 put in since. I have no means of knowing accurately until the time of making up our annual report, about the first of July.

Very truly yours,

ALFRED GRISWOLD, Supt.

3. Cannot give the aggregate length of sewers, or what proportion of the population have drainage connection with them.
4. No new ordinances for sanitary purposes. See Report 1888.
5. Board of health, the town council.
6. Health Officer, Mason B. Wood.
7. Gratuitous vaccination has been provided during the past year for the public school children.
8. Undertakers have promptly sent in their returns of death.

T. A. SWEETLAND, *Town Clerk.*

FOSTER.

1. No work for the promotion of public health contemplated by the town authorities during the year.
2. Have no water service for general use.
3. No public sewerage.
4. No new ordinances in abatement of nuisances or for any sanitary purpose.
5. Board of health, the town council.
6. Health Officer, Henry Arnold, M. D.
7. Gratuitous vaccination was provided a few years since, but not the past year.
8. Undertakers have promptly sent in their returns of death.

E. D. LYON, *Town Clerk.*

GLOUCESTER.

1. Nothing new for the promotion of public health.
2. No water service for general use.
3. No public sewers.
4. There have been no new ordinances passed by the town council.
5. Board of health, the town council.
6. Health Officer, George A. Lee.
7. Only a few cases of vaccination known during the past year.
8. Undertakers have promptly sent in their returns of death.

C. W. FARNUM, *Town Clerk.*

JOHNSTON.

1. No work for the promotion of public health except free vaccination.
2. By extension of water service for general use, the proportion of the population, by estimation, supplied with the same at the end of the year was probably three-fourths of that in Olneyville and vicinity.
3. No public sewerage.

4. No new ordinances in abatement of nuisances. The town has a contract with A. E. Field & Son for the removal of swill and garbage from the compact part of the town until June 1st, 1890.

5. Board of Health, Thomas C. Lawton, M. D., Charles A. Barnard, M. D., Frank A. Payan, M. D., Martin Mann.

6. Health Officers, as above.

7. Gratuitous vaccination has been ordered, but not yet completed.

8. So far as I know, undertakers have promptly sent in their returns of death.

W. F. KING, *Town Clerk.*

LINCOLN.

2. Considerable extension of water service for general use. Cannot state what proportion of the population was supplied with the same at the end of the year.

3. About one mile of sewers constructed.

4. No new ordinances for any sanitary purpose.

5. Board of health, the town council.

6. Health Officer, Thomas F. Quigley.

7. Gratuitous vaccination was provided during the past year. No return yet of number.

8. Undertakers have promptly sent in their returns of death.

E. B. SMITH, *Town Clerk.*

NORTH PROVIDENCE.

1. Nothing unusual for the promotion of public health contemplated by the town authorities.

2. Reservoir completed on Fruit Hill. Water introduced in Lymanville.

3. No public sewerage.

4. Nothing new in abatement of nuisances or for any sanitary purpose.

5. The legal board of health, the town council.

6. Health Officer, Sanford E. Kinnecom.

7. No gratuitous vaccination provided during the past year.

8. Undertakers have sent in their returns of death with fair promptness.

T. H. ANGELL, *Town Clerk.*

NORTH SMITHFIELD.

1. No particular work for the promotion of public health by the town authorities.

2. No public water service for general use. Water was introduced into a portion of the village of Forestdale by private parties, and corporations have given increased sanitary attention to villages.

3. No public sewers.
4. Ordinances in abatement of nuisances not changed.
5. Board of health, the town council.
6. Health Officer, Joshua Wardle.
7. No gratuitous vaccination was provided during the past year.
8. No undertakers located in town.

BYRON A. ANDREWS, *Town Clerk.*

PAWTUCKET.

1. Ordinances in relation to public health quite fairly enforced.
2. By extension of water service the proportion of the population now supplied, probably about two-thirds, (17,000). See Report of Water Commissioners and Superintendent of Water Works, appended.
3. See Report of Board of Sewer Commissioners, appended.
5. The Board of Aldermen.
6. Health Officer, George H. Stanley, M. D.
7. Vaccination was provided.
8. Undertakers have promptly sent in their returns.

EXTRACT FROM THE REPORT OF THE SEWER COMMISSIONERS.

The survey of the Moshassuck river water shed is nearly finished. We are now able to outline a system of sewerage for that district.

The question of disposal of the sewage was very fully discussed in our report of 1887, page 17 to 26, inclusive. We can add but little to what was then written, further than the experiments made by the Massachusetts State Board of Health, at the Experimental Station at Lawrence, in filtering sewage, as described in their report of 1889, proves conclusively that intermittent downward filtration, which may or may not be combined with broadcast irrigation, is the only practical method of sewage disposal where sewage cannot be turned into very large bodies of water.

We again report there are * “but two ways for the city of Pawtucket to dispose of its sewage. One to pump the sewage on to Seekonk Plains and care for it with that of the Blackstone river sewers by filtration. The other will be by an arrangement with the city of Providence whereby they will take the sewage at the city line and care for it with their own sewage at Field's Point.”

Although favoring filtration, to hasten work and have more than one way by which to dispose of the sewage, we recommended in our reply to the Committee as follows :

† “We would recommend that authority be obtained from the General Assembly at its next session, to acquire by purchase or otherwise, the right of way to

* Report 1887, page 17.

† Page 6.

build main drains or common sewers, to secure land for sewerage works, irrigation fields or filtration beds, and for authority to contract with the city of Providence for connection with their system of sewers."

SYSTEM OF SEWERAGE.

The greater part of the section known as the West avenue district is high above the river, but it is swampy, the subsoil being a hardpan impervious to water. A part of Cat Swamp lies in this district. The water from the brook that rises in Cat Swamp and flows through this district must be cared for. This water, with the grade available, will fill a twelve inch pipe ; it often more than fills the twenty-four inch pipe now in use.

In building sewers through this district, the springs that feed the brook will gradually be drained, and the water taken off at a lower level by the sewers. If allowed to flow in the sewers with household wastes, this clean water becomes sewage and must be cared for as sewage at a price per thousand gallons. If allowed to flow through separate pipes, or through sewers used for storm water only, it can be turned into the Moshassuck river.

For this district we recommend that the main sewer be built on a double system, that is, household waste in one pipe, storm and ground water in a large sewer, the smaller sewer to be connected with the larger by storm overflow connections.

The drainage of this district by the above system, not only lowers the ground water and opens up a very valuable tract of land for building purposes, but will remove a very prolific source of malaria and typhoid fever germs.

The greater part of the section north of West avenue district is dry. The ground water, as indicated by wells, is from ten to thirty-five feet below the surface. The wet parts are close to the river, and can, by an inexpensive system of land tiles, be drained.

We recommend for the Moshassuck river water shed, excepting the West avenue district as above, the same system of sewerage as is used and has proved satisfactory in the Blackstone river water shed, i. e., a restricted combined system.

COURSE OF MAIN SEWERS.

The Moshassuck river, from Mineral Spring avenue in Pawtucket to the Philip Allen Print Works in Providence, during the summer months, is a very small river and flows through flat, swampy land, the flow being very sluggish.

Sand and silt will get into the sewers through the catch basin and thence into the river, causing injury to property owners below, unless special works be built at the out fall of the storm sewers.

Immediate relief must be had from storm water at the junction of Lonsdale avenue and Main street.

In our report of 1887 we say, * "Water at this point has and will continue to cause trouble until sewers are built in this district."

Already claims to the amount of five thousand (\$5,000) dollars have been made, as compensation for injury caused by storm water at this point.

* Page 17.

As soon as the necessary right of way can be secured a main sewer should be built. The sewer should be used for storm water only, until such time as the sewage can be treated or disposed of.

The main sewer for the West avenue district will be built from the Moshassuck river to Main street, through Main street and West avenue to Jefferson avenue.

A main branch should be built through Trenton street, crossing Pawtucket avenue and continue through Trenton and other streets to Pidge avenue; from this point the further course of the main sewer will be determined somewhat by the use made in the future of the land immediately south of Pidge avenue.

A second main branch will be through Moulton street to Pawtucket avenue.

Whitman street should be extended to Moulton street and West avenue, and a main branch sewer laid through this extension to Wayland avenue.

Mineral Spring avenue and the main streets to the north extend direct from the divide of the water shed of the Moshassuck and Blackstone rivers to the Moshassuck river. The main sewers will follow the same course.

An intercepting sewer will be built from or near the northerly boundary line of the city of Providence, northerly, to the southerly boundary line of the town of Lincoln.

This sewer must follow the general course of the river to Mineral Spring avenue; from Mineral Spring avenue it will be built on or parallel with the road bed of the Moshassuck Valley Railroad.

This sewer need not be built all at one time, but it must keep pace with the building of main sewers in this district.

Under no consideration should the sewage from any part of this district be discharged into the Blackstone canal or the Moshassuck river.

The intercepting sewer will collect the sewage (dry weather flow) from all the sewers in Pawtucket that are in the Moshassuck river water shed, and carry it to the line of the city of Providence where it can be discharged by gravitation into the sewers of the city of Providence, or be pumped for filtration on to Seekonk Plains.

The land at this point is well adapted for a pumping station and settling tanks.

In view of the resolutions passed by the City Council and the expressed views of citizens, residents of this district, we believe the time is at hand when some action must be taken in building sewers and disposing of the household and manufacturers' waste of this district.

We therefore recommend that, as soon as the necessary authority is obtained from the General Assembly, the Board of Sewer Commissioners be empowered to contract with the city of Providence (if satisfactory arrangements can be made) to care for the sewage of the city of Pawtucket; also, that they be empowered to procure, by purchase or otherwise, land on Seekonk Plains for filter beds and irrigation fields.

If a contract is made with the city of Providence to care for the sewage of the city of Pawtucket, it will be from four to five years before their system of sewerage and sewage disposal is so far completed that they can take and care for the sewage of Pawtucket.

In the meantime, a portion of the land purchased (fifty-five acres) by the old town of North Providence of Asa Pike, can be used for filter beds to filter the sewage. This use of the land will not cause a nuisance, or in any way injure the land for future use. If the land is to be used for a park after the filter beds are abandoned, it will be decidedly benefited by the sewage.

If a contract is not made with the city of Providence, and it is decided to care for the sewage by filtration, the sewage can be disposed of on the Pike land, as above, until the necessary land is secured on Seekonk Plains, and the filter beds built.

It will be advisable, however, to secure the land for the permanent filter beds as soon as possible, as this land can be used to dispose of the sewage by broadcast irrigation as soon as the pipe is laid to convey the sewage to it, even before the filter beds are built, thus saving the expense of temporary filter beds.

FLUSH TANKS.

Ten automatic flush tanks (Rogers Field new pattern) have been built during the past year, making the total number forty-two (42). Thirty-four (34) are in operation, the other eight have been put in lately and are not connected with the water works. The tanks in use continue to work perfectly; they keep the sewers to which they are attached clean, and have cost nothing for repairs.

We are more fully convinced the longer we use flush tanks, that they are a necessity in a system of sewerage like that in use in Pawtucket; also, that it is the cheapest, and, in fact, the only way of keeping sewers clean.

CATCH BASINS.

There have been built and connected with the sewers twenty-three (23) catch basins, making the total number two hundred and sixty-four, and with gutter grates, two hundred and seventy-nine. After the catch basins are built, they are cleaned and cared for by the Highway Department. The work is paid for by the Sewer Department.

The whole principle of allowing one department to do work, and requiring another department to approve and pay the bills for work which they did not order, over which they have no control and know not whether it has been done or not, is entirely wrong.

If the Highway Department is to clean the basins the expense should be charged to the regular appropriation for maintenance of highways, or a special appropriation for cleaning catch basins should be made and placed in the hands of the Commissioner of Highways.

The appropriation for cleaning catch basins should be one thousand (\$1,000) dollars.

Sewers have been constructed through 18 streets during 1889.

From December 1, 1888, to December 1, 1889, there has been built 10,713 feet of pipe sewers and 1,444 feet of brick sewers, a total of 12,157 feet = $2\frac{39}{100}$ miles.

The total length of brick sewers = $2\frac{43}{100}$ miles, of salt glazed pipe sewers = $10\frac{56}{100}$ miles. There are 397 feet of iron pipe sewer and 1,289 $\frac{11}{100}$ feet of cement pipe overflow. A total of $13\frac{12}{100}$ miles.

Since December 1, 1888, there have been 140 connections made with the sewers, connecting 148 houses, 3 manufactories and one public park.

The total number of connections with the sewers, is 604. Number of buildings, 684.

There will be needed for maintenance and care of sewers, including cleaning catch basins, seven thousand (\$7,000) dollars.

ISAAC SHOVE,	}	<i>Board of Sewer Commissioners.</i>
FRED. W. EASTON,		
WILLIAM P. MORONEY,		

A. R. SWEET, *Engineer and Superintendent.*

EXTRACTS FROM THE REPORT OF SUPERINTENDENT OF WATER WORKS.

No material change has been made on the works except the placing of two 90 horse power water wheels in Station No. 2, where we had two smaller wheels aggregating 125 horse power. The increased amount of water pumped by them shows the advantage of having suitable wheels. The cost of replacing them was \$1,465 08. The amount of water pumped was 297,829,006 gallons, almost one-fourth of all the water used, by the wheels alone. It will be seen by the engineer's report that the engine at this station has run only forty days during the whole year, pumping 57,204,850 gallons.

It affords me great pleasure to refer to the trial of the fire hydrants on September 19, 1889, when the Chief Engineer of the Fire Department was invited to play seventy fire streams at once, and which was successfully accomplished, holding eighty pounds pressure during the time the test was made. The test was made on the twenty-inch force main, three and one-half miles long, leading from the pumps through the centre of the city to the storage reservoir on the heights, at an elevation of 301 feet above tide-water. Four thousand and forty feet of this main was used, and the streams were taken from nine six-wayed and eight two-wayed hydrants. Six Edison recording gauges were placed on the line, located so as to give the best results of the loss of pressure. The cards are to be seen at the office, showing with what nicety and precision they exemplify and verify the pressure. By the use of these gauges we were enabled to state facts which we should have been unable to do without them. I desire to say that they not only verify the pressure on the mains, but detect leaks and the opening of hydrants, or any heavy draught of water for legitimate or illegitimate purposes.

No well conducted water works can afford to be without recording gauges, and, when properly located, they will in my opinion pay for themselves within one year. We challenge any water works in the United States to play seventy *one inch* fire streams through fifty feet of hose, and maintain eighty pounds pressure during the trial, the pressure to be verified by recording gauges placed in suitable position on the line of pipe.

The future extension of the works will be governed by the growth of the city, and, as is well known, the growth of our city is equal to any in New England of similar population.

It will be seen that appropriations will be required to accommodate the necessities demanded, and I may say that the larger the works the greater the demand

for extensions. The demand for extensions of mains and new services during the past year has been fully up to our anticipations, and can be seen by perusing the statements further along in this report. I know of no reason why the same demand will not exist for the year to come.

It is also very gratifying to note the increase in revenue during the year. The practical working of the meters still maintain the good results which have heretofore been stated, and the confidence in them is fully verified by the constant and increasing demand to have the benefits they produce over the faucet rates. This is shown by the unusual large number which have been called for the past year, being 266 meters out of 299 services.

It is gratifying to know that consumers are becoming satisfied that the *meter* cannot register against them. It is only now and then an exceptional case where we have complaint made, and that is universally where they neglect to keep their fixtures in proper repair, and allow leaks to exist in water closets or tanks where the overflow into the sewer or cesspool cannot readily be seen.

It will be observed that the duty of the No. 1 engine is very much less than during previous years, owing to the fact that having reinforced our pumping capacity by the introduction last year of the six million pump it has not been required to run so continuously to produce the needed supply of water. It has pumped 290,927,553 gallons.

We have also during the past year been experimenting with soft coal, coal dust, also washed pea and other kinds of coal at less cost, to compare the relative results, and the conclusion we have come to is to let well enough alone and to use the same kind of coal we have used in former years, as the loss on duty more than equals the cost of coal. It is very gratifying to know that during the past year Professor J. E. Denton of Stevens Institute of Technology, Hoboken, New Jersey, has made an exhaustive test of the duty of No. 1, or better known as the Corliss High Duty Pump, and he fully verifies all previous statements made by this department, even to last year when the engine made the unprecedented duty of 124,512,184 foot pounds for the whole year, pumping 899,052,732 gallons of water, or working 338 days of 22 hours and 22 minutes per day. An appendix containing Prof. Denton's test will accompany this report.

The new engine at No. 3 Station has performed its work during the year to the satisfaction of all concerned, and bids fair with age to be a successful competitor for honors with the No. 1, as anticipated by its designer and builder, the late lamented George H. Corliss.

This engine has run 249 days, pumping 651,260,659 gallons, or about one-half of the needed supply.

During the year the works have been extended. Total length of mains, 106+ miles.

HYDRANTS SET AS FOLLOWS :

Total, 12 for year, added to 795 as per last year's report, making a total of 807 on the works.

APPLICATIONS.

Applications for water have been made as follows :

In Pawtucket	161
In Central Falls Division.....	57
In Lonsdale and Valley Falls Division.....	30
In East Providence Division	45
In Ashton Division.....	6
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Total for year.....	299

SERVICES.

161 services have been made in Pawtucket.

57	"	"	"	Central Falls.
30	"	"	"	Lonsdale and Valley Falls Division.
45	"	"	"	East Providence Division.
6	"	"	"	Ashton Division.

299 total for the year.

5061 number of services now in use.

METERS.

Two-hundred and sixty-six services have been supplied with meters during the year.

3,274 metered services now in use.

RECEIPTS.

For water in Pawtucket ..	\$67,131 43
For water in Lonsdale and Valley Falls Division	15,498 66
For water in East Providence Division.....	7,608 60
For water in Central Falls Division.....	13,664 54
For water in Ashton Division.....	531 92
<hr/>	
	\$104,375 15

MAINTENANCE EXPENSES.

Rebates paid.....	\$7,187 89
Interest transfer ..	62,521 87
Maintenance, repairs, etc	34,166 17
Balance on hand ...	499 93
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	\$104,875 86

RECEIPTS FOR WATER TO DATE.

Total amount received from Oct. 1, 1878, to Dec. 1, 1889..... \$731,826 89

Of this amount, \$218,107.07 has been expended for maintenance.

Whole cost of works to date\$1,555,830 64

Amount of sinking fund due to the water works account..... \$240,000 00

EXTRACTS FROM REPORT OF CHIEF ENGINEER.

NUMBER ONE STATION.

Pumping expenses for the year ending November 30, 1889 :

287,169 lbs. of coal, at \$5.35 per ton of 2,000 lbs.....	\$768 17
354,545 lbs. of coal, at 4.88 per ton of 2,000 lbs.....	850 08
22,820 lbs. of dust, at 1.75 per ton of 2,000 lbs.....	19 96
17,350 lbs. Cumberland, at \$4.25 per ton of 2,000 lbs....	36 86
Repairs on engine.....	42 65
Repairs on boilers.....	43 39
Oil, waste and packing.....	128 75
Gas.....	141 30
Sundries.....	58 52
Salaries of engineers and firemen.....	2,062 87
	<hr/>
	\$4,152 45

Total number of gallons pumped	290,927.553
Cost of raising 1,000,000 gallons into reservoir.....	\$14 27
Cost of raising 1,000,000 gallons one foot high.....	0.0528
Average number of gallons pumped per pound of coal	453 36
Average number of gallons raised 100 feet per pound of coal	1224.61
Total number of days pumping.....	194
Average pumping time per day ..	12h. 34m.

NUMBER TWO STATION.

Pumping expenses for the year ending November 30, 1889 :

Steam Power.

77,003 lbs. coal, at \$5.35 per ton of 2,000 lbs.....	\$205 98
87,610 lbs. coal, at 4.88 per ton of 2,000 lbs.....	213 76
Repairs.....	104 76
Oil, waste, packing, etc.....	110 57
Salaries of engineers and firemen.....	303 44
	<hr/>
	\$938 51

Total number of gallons pumped	57,204,850
Cost of raising 1,000,000 gallons into reservoir.....	\$16.46
Cost of raising 1,000,000 gallons one foot high.....	0.0617
Total number of days pumping	40
Average pumping time per day.....	11h. 15m.

Water Power.

20,550 lbs. coal, at \$4.25 per ton of 2,000 lbs.....	\$43 67
14,700 lbs. coal, at 1.75 per ton of 2,000 lbs.....	12 87
13,240 lbs. coal, at 4.00 per ton of 2,000 lbs.....	26 48

10,744 lbs. coal, at \$3.50 per ton of 2,000 lbs.	\$18 80
13,478 lbs. coal, at 4.88 per ton of 2,000 lbs.	32 88
Repairs	40 95
Oil, waste, packing, etc.	85 99
Salaries.	1,432 22

\$1,693 86

Total number of gallons pumped	297,829.006
Cost of raising 1,000,000 gallons into reservoir.	\$5.68
Cost of raising 1,000,000 gallons one foot high.	0.0211
Total number of days pumping.	291
Average time per day.	14h. 52m.

NUMBER THREE STATION.

Pumping expenses for the year ending November 30, 1889 :

696,320 lbs. coal, at \$5.35 per ton of 2,000 lbs.	\$1,862 65
34,100 lbs. coal, at 1.75 per ton of 2,000 lbs.	29 83
18,630 lbs. coal, at 4.25 per ton of 2,000 lbs.	39 58
799,484 lbs. coal, at 4.88 per ton of 2,000 lbs.	1,950 74
50,805 lbs. coal, at 3.50 per ton of 2,000 lbs. . .	88 90
Oil, waste and packing.	263 01
Sundries.	163 25
Salaries of engineers and firemen.	2,417 88

\$6,815 84

Total number of gallons pumped	651,260,659
Cost of raising 1,000,000 gallons into reservoir.	\$10 46
Cost of raising 1,000,000 gallons one foot high.	0.0375
Average number of gallons pumped per pound of coal.	418.53
Average number of gallons raised 100 feet per pound of coal.	1,165.52
Total number of days pumping.	249
Total pumping time per day.	10h. 53m.

NUMBERS ONE, TWO AND THREE STATIONS.

Total number of gallons pumped.	1,297,222.068
Cost of raising 1,000,000 gallons into reservoir.	\$10.48
Cost of raising 1,000,000 gallons one foot high.	0.0382
Average daily consumption of water in United States gallons.	3,554,038

JOHN H. WALKER, *Chief Engineer.*

In conclusion I wish to say (with pardonable pride) that having been connected with the works for the past eleven years, the first as one of the Water Commissioners to complete the original plan as contemplated by the town of Pawtucket, it affords me great pleasure to be able to present to your honorable

body and the taxpayers the results. Having superintended the construction of new pumping stations, dams and reservoirs, also the laying of some seventy miles of mains, with a mode of filtration of all our water equal to any ; having seen the revenue increase from \$16,000 per year to \$104,000, and it having been able to pay the whole maintenance and interest account for the past eight years without any taxation from the people, it is with pleasure I congratulate you on the result.

We have made large expenditures in anticipating the wants in the near future, but in doing so we have placed ourselves in a position that assures us in case of serious fire we are able to successfully cope with it. Many towns and cities do not take the hydrant service into account in building their works, but Pawtucket has, and all extensions which have been made are looking to the efficiency of our system for extinguishing fire. During the past year ten six-wayed hydrants have been placed in the thickly settled part of the city, in place of eight two-wayed, where large and extensive blocks have been built, for the better protection of the same, and as the works increase it should be the aim of those in charge to always have in view the efficiency of our water works in case of serious fire. During the past year the outside demands for fire protection have been amply supplied, and I venture to say that no city of our size can be found where the fire protection extends to the extreme parts of the city as it does here. This should induce capitalists and manufacturers to locate in our city (and I am happy to say that it has in several cases during the past year), and when it becomes known that we have a better fire protection, with an efficient fire department, with a standing water pressure of 65 to 120 pounds to the square inch on the mains, whereby we can inject into any boiler without the aid of an injector, the city will *reap* from the *seed* it has *sown* in building her water works looking to future wants. From the revenue we shall be able to pay all maintenance and interest accounts for the year to come, and can recommend a transfer of \$10,000 into the sinking fund.

EDWIN DARLING, *Superintendent.*

LUCIUS B. DARLING,	}	<i>Water Commissioners.</i>
ROBERT D. MASON,		
OLNEY ARNOLD,		

PROVIDENCE CITY.

1. Various ordinances, orders and resolutions, having relation to the promotion of the public health, were made and passed by the authorities of the city during 1889, the most important of which, and doubtless without exception the most important in the history of the city, was the order for the commencement of the improved system of sewerage, planned by S. M. Gray, City Engineer, and member of the State Board of Health.

2. The extension of water service for household use, the fire department and the various industries, has been very large. The Fruit Hill reservoir has been completed and water turned on. See appended extracts from Second Inaugural Address of Hon. H. R. Barker, Mayor, the Report of the City Engineer and the Report of the Department of Public Works.

3. See reports as indicated above.

4. No new ordinances having particular relation to the public health, except as stated above.
5. The board of aldermen constituted the board of health.
6. Charles V. Chapin, M. D. Superintendent of Health ; Gardner T. Swarts, M. D., Medical Inspector ; John S. Rogers, Sanitary Inspector ; Charles H. Leonard, M. D., Chief of Vaccinating Staff.
7. Gratuitous vaccination has been provided during the year. See Report of Health Officer.
8. Undertakers have promptly sent in their returns of death.

EXTRACTS FROM MAYOR BARKER'S INAUGURAL ADDRESS.

WATER WORKS.

By the construction of the Fruit Hill reservoir the system of water supply for this city is practically completed. The reservoir was filled in December last, and now supplies the water for the high service districts, which have formerly been supplied by direct pumping by the engines at the Hope reservoir. Hereafter the engines at the Hope station will not be run continually, but only as often as it may be necessary to keep the high service reservoir at Fruit Hill approximately full, and opportunity will be given for making such changes in this pumping apparatus as will materially reduce the expenses of operation.

The elevations of the two highest points in the high service districts supplied from this reservoir are 202 and 201 feet above mean high tide, the former being upon Tin Top Hill, so called, and the other near the intersection of Smith street with the city line, the static head at which will be about 73 feet, while the entire area of both high service districts will have an average static head of from 92 to 193 feet, dependent upon the elevation of the ground. It has also been arranged that a main pipe can be laid from the 24-inch main, connecting with the Fruit Hill reservoir, which will transmit to the business centre of the city for fire purposes a static head of about 262 feet, thus furnishing an independent supply of water in case of an extensive conflagration within that district.

A large area in the neighborhood of Mount Pleasant, which is situated within the high service limits, is still supplied with water from the low service, and as the pressure in this locality is inadequate both for fire and domestic purposes, steps should be taken at an early day to connect the same with the high service.

The city now has three reservoirs, the united storage capacity of which is 152,000,000 gallons, sufficient to furnish a supply for the present ordinary uses for twenty-five days, in the event of temporary stoppage of the pumping engines at Pettaconsett. While, however, ample provision is made for the storage of the water after it is pumped from the source of supply, yet due regard should be given to that most important part of the water works, the main pumping engines, in order to prevent the possibility of any accident thereto, and at the same time provide a sufficient reserve in the event of an accident or temporary disarrangement of those in use. I am informed that additional pumping apparatus at Pettaconsett will soon be required.

During the past year there has been a very marked increase in the number of water takers, and for the first time since the introduction of water the receipts

therefrom at the close of the fiscal year have been in excess of the cost of interest and maintenance. Having now arrived where it is possible each year to increase the excess of income from water rents over the expenditures for maintenance, is it not wise to consider the question of a reduction in the rates in such a manner as will result in still further increasing the consumption of water, while it will not reduce the income to the city from this source?

In connection with the water works due care has been exercised to prevent the pollution of the Pawtuxet river, and stringent measures will be taken against any one who corrupts or renders the same impure. The penalty prescribed by the public laws for such an offence is extremely severe, and if a regard for the health of others will not restrain persons who pollute the river and its tributaries from which the city obtains its supply of water, they must be deterred by the heavy fine and imprisonment which the law imposes.

SEWERAGE.

July 22, 1887, the improved sewerage plan was adopted, and preliminary steps taken by the City Council of that year to begin the proposed work. Not only the land for the precipitation works was acquired, but the greater portion of the rights of way for the main trunk sewers in the sixth and seventh wards has now been secured. While the necessary steps for the inception of the general system were taken without any unnecessary delay, the actual work of building the sewers was not ordered by the City Council until after the election of a Commissioner of Public Works, in February last. Thus it will be seen that all legislation since the adoption of the plan has been fully in accord with the proposed system, and in harmony with the design of its projector.

Since, however, the actual work of building the sewers was commenced, objections have been raised by numerous taxpayers to some of the features of the plan, and if it can be shown that these objections are of sufficient importance to warrant their consideration *without detriment to the improvement of the sewerage*, they should be recognized. By those making objections it is claimed that the precipitation works and siphon houses are not needed for the present, and that the sewage of the city, with a population of 135,000, can be permitted to flow into the Providence river for some years to come without injury to the public health. Especially is this claim advanced at the present time for the reason that experiments are now being made to determine the best manner of caring for manufacturers' wastes, which give evidence that such a disposition can be secured as to very materially reduce the causes of pollution of our rivers, and lessen the quantity of deleterious matter that is to be cared for by the sewers. If *it is certain that the public health would not be jeopardized* by the postponement of the building of the precipitation works and siphon houses a material saving will be made to the city in the amount requisite for their maintenance, a sum estimated at \$100,000 annually, which in itself should be an item for consideration.

I have no doubt that eventually the increase of population will require the carrying out of the sewerage plan, with little if any modification of the original design, but I fail to understand what objection there can be to building the main and lateral sewers first, and leaving the precipitation works and siphon houses until it is unquestionably shown that a necessity actually exists for their construction.

Extracts taken from the Reports of the City Engineer and Commissioner of Public Works.

WATER WORKS.

There were six hundred and forty-two (642) new water services opened during 1889, making the whole number from the beginning to December 31, 1889, fifteen thousand one hundred and thirty-six (15,136).

Total length of services laid during thirteen years ending December 31, 1889, 127,267.22 feet or 23.53 miles.

Thirty-one hydrants were set during 1889. Total number of hydrants now in use, thirteen hundred and twenty-five (1,325), thirteen hundred and fourteen (1,314) flush, and eleven post hydrants. These include the hydrants set in the town of Johnston.

Lengths of water pipe in the ground December 31, 1889 :

Length in feet.....	1,148,678 64
Length in miles.....	217.55

The above includes lengths of pipe in Johnston, Cranston, North Providence and Warwick.

Total number of applications for water service to January 1, 1890, fifteen thousand eight hundred and nine (15,809).

The receipts for water each year since the commencement have been as follows :

Year.	Amount.	Year.	Amount.
1872.....	\$41,003 51	1881.....	\$260,530 87
1873.....	97,386 09	1882.....	269,318 77
1874.....	132,052 39	1883.....	283,632 89
1875.....	165,144 71	1884.....	302,368 36
1876.....	183,868 73	1885.....	313,561 21
1877.....	200,039 39	1886.....	323,084 67
1878.....	218,883 33	1887.....	339,513 00
1879.....	229,551 78	1888.....	346,731 58
1880.....	247,705 06	1889.....	337,497 97

Total number of service stops in actual use January 1, 1890, fourteen thousand two hundred and thirty-three (14,233).

SEWERS.

Total length of pipe laid in 1889 :

Lengths in feet.....	12,154.5
Lengths in miles.....	2.30

Total lengths of sewer pipes in the ground January 1, 1890, 332,680 feet, or about 63 miles.

There were nearly two and one-third miles of sewers constructed during 1889.

The following were set and connected with sewers during 1889 :

Catch-basins, sixty (60) : extra inlets, thirty (30) ; manholes, seventy-nine (79).

Total to January 1, 1890 :

Catch-basins, twenty-one hundred and fifty-three (2,153).

Manholes, thirty-one hundred and seven (3,107).

House connections, five thousand five hundred and ninety-five, (5,595).

PUBLIC PARKS.

Large improvements were made in the Roger Williams, Hayward and Tockwotten Parks.

SCITUATE.

1. No work for the promotion of public health except ordering the abatement of nuisances.
2. No water service for general use.
3. No public sewerage.
4. Nothing new in the line of ordinances in abatement of nuisances or for any sanitary purpose.
5. No board of health beside the town council.
6. Health Officer, W. J. Smith, M. D.
7. No gratuitous vaccination provided during the past year.

D. H. REMINGTON, *Town Clerk.*

SMITHFIELD.

1. No unusual work for the promotion of public health contemplated by the town authorities during the year.
2. No water service for general use.
3. Have no public sewerage.
4. Nothing new for sanitary purposes.
5. Board of health, the town council.
6. Health Officer, Jenckes Smith.
7. No gratuitous vaccination during the past year.
8. Undertakers have promptly sent in their returns of death.

OSCAR A. TOBEY, *Town Clerk.*

WOONSOCKET.

1. As to any work for the promotion of public health, except as stated below, there has been none that I am aware of.
2. The water mains have been extended somewhat. Have no data.

3. No public sewers, but have them in contemplation.
4. No *new* ordinances passed.
5. Board of health, the board of aldermen.
6. Health Officer, Dr. George W. Jenckes.
7. No gratuitous vaccination provided during the year.
8. Undertakers have promptly sent in their returns of death.

A. E. GREENE, *City Clerk*.

EXTRACTS FROM THE INAUGURAL ADDRESS OF HON. D. B. POND, MAYOR.

WATER WORKS.

The receipts from the Water Works show a gratifying increase. The wisdom of introducing water into the city has been fully justified, and the benefits and convenience of the works go far towards reconciling us for much original imperfect work and unnecessary expense. Experience, while being a good teacher, has been a costly one in this matter. It is to be hoped that most of the original imperfections have been remedied, and that appropriations for construction account may be devoted to legitimate extension of the works rather than to the repairs and correction of original faulty construction.

SEWERAGE.

The question of sewerage is one that must soon engage the attention of the city. The demand for sewerage facilities, in some sections of our city, is already imperative, and its convenience and importance is generally admitted.

With the increased consumption of water by our citizens, and with the present and prospective growth of our population, some method of disposing of the waste water and sewerage of the city other than by the ordinary and simple, but entirely inadequate methods now in vogue, must soon be adopted. The problem is a large one, and we may well hesitate in undertaking it. But it cannot, in the interest of good health in our city, be much longer deferred. I believe the time has arrived to make a beginning, but as it is a matter largely affecting both our pecuniary and vital interests, the subject should have much consideration and thought before adopting any particular plan or process.

I recommend that the subject be referred to a joint special committee who shall examine the whole subject, with power to procure expert testimony as to the best plan to be pursued, and that general estimates be made of the probable cost of the same, and generally to obtain all possible information upon the subject. All of which shall be reported to this council, so that if it is deemed wise, necessary legislative action may be had at an early day.

I recommend that a moderate appropriation be made to enable the committee to accomplish its work.

PUBLIC PARK.

The writer in town meeting, some years ago, agitated the question of a Public Park, and upon his motion a committee was then appointed to take the subject into consideration. The committee soon after made a selection of a location,

but were never able to get a price fixed for the land. My predecessor has also referred to this subject, and a committee was appointed, but I do not learn that anything has been accomplished. With our large population, and with absolutely no open squares or places for the public to assemble in for healthful recreation and enjoyment, our people must become trespassers upon private property unless contented to remain indoors, or if congregated in the streets, become subject to the order of the police to "move on." Parks and public squares are the breathing places of cities—sanitariums for those necessarily much confined—educational and wholesome in moral influences, and preventative of turbulence and disorder by presenting quieting influences to restless minds. Emerson says : "There is no police so effective as a good hill and wide pasture in the neighborhood of the village where the boys can run and play and dispose of their superfluous strength of spirits, to their own delight and the annoyance of nobody." The city cannot look to the generosity of individuals in this matter, but must act for itself. I recommend that an act of the Legislature be obtained authorizing the appointment of a commission for this purpose who shall have power to lay out one or more Public Parks, and to take the necessary land under the right of eminent domain, whenever the location and probable expense shall have been approved by the City Council.

WASHINGTON COUNTY.

CHARLESTOWN.

1. No work for the promotion of public health contemplated by the authorities during the year.
2. Water for drinking purposes taken almost exclusively from wells.
3. No public sewerage.
4. No new ordinances in relation to health.
5. Board of health, the town council.
6. Health Officer, A. A. Saunders, M. D.
7. Gratuitous vaccination has not been provided during the past year.
8. Undertakers do not promptly send in their returns of death.

GEORGE C. CROSS, *Town Clerk.*

EXETER.

1. Nothing new for the promotion of public health by the town authorities.
2. No water service for general use.
3. No sewerage.
5. Board of health, the town council.
6. Health officers, the town council.
7. No gratuitous vaccination provided during the past year.
8. Undertakers do not promptly send in their returns of death.

J. H. EDWARDS, *Town Clerk.*

HOPKINTON.

1. Nothing new for the promotion of public health.
2. No water service in town.
3. No public sewers.
4. Nothing new for any sanitary purpose. See ordinance in State Board of Health Report, 1888.
5. No board of health beside the town council.
6. Health Officer, Israel Gates.
7. Gratuitous vaccination has not been provided since November, 1888.

E. R. ALLEN, *Town Clerk.*

NARRAGANSETT, DISTRICT OF.

1. Some of the work for the promotion of public health contemplated by the town authorities during the year was a system of sewerage contracted for, and also the introduction of water for general use.
2. By introduction and extension of water service for general use the proportion of the population, by estimation, supplied with the same at the end of the year was one-third or thereabouts.
3. The aggregate length of sewers, by estimation as contemplated, about 3 miles. Not yet completed.
4. Sanitary ordinances rigidly enforced. See Manual appended.
5. District council, the board of health.
6. Health officers, as above.
7. No gratuitous vaccination provided during the past year.
8. Undertakers have promptly sent in their returns of death.

W. H. CASWELL, *District Clerk.*

MANUAL OF RULES AND REGULATIONS RELATIVE TO THE HEALTH OF THE
DISTRICT OF NARRAGANSETT, RHODE ISLAND, MADE BY THE
COUNCIL OF SAID DISTRICT, JUNE 25TH, 1889.

I. Every privy vault and every vault connected with the privy, and every cesspool, must be impermeable and secure against any saturation of the vaults or of the ground above or about the same.

No privy vault or cesspool shall be allowed to remain nearer than thirty feet from any tenement or lodging house, hotel, or other habitable dwelling in this district.

Privy vaults shall not have a greater depth than two feet, *unless* connected at the upper end with district water, and at the lower end with the street sewer. These vaults must be so constructed as to admit of complete discharge, and must be secure against leakage and the escape of gases and offensive odors.

II. All the foregoing shall apply to all privy vaults and cesspools which shall be constructed hereafter and all those heretofore built, and for or on account of

which any complaint may be made to the Council or Health Officer of the District of Narragansett, shall, if so ordered by said Council or Health Officer, be by the owner or occupant thereof reconstructed in accordance with the foregoing rules, or filled and replaced by new vaults so constructed.

Vaults shall be emptied between the hours of ten o'clock in the evening and eight o'clock in the morning. The removal of the contents of vaults and cesspools must be from November 1st to May 1st of each year only, except by special permit of the Council, effected in such a manner that there shall be no leakage in the public streets, and reasonable care must be taken to prevent the escape of odor in transportation.

III. Every cesspool shall be securely covered and shall have proper means of ventilation.

IV. Kitchen and waste sinks must be safely and securely connected with the sewer or well-covered drain, and must not be permitted to discharge by spouts, or otherwise upon the sides of the house, or on the surface of the ground.

Sinks, laundry tubs, and water closets shall have as near to them as practical, suitable traps.

V. Soil pipes, water pipes, and all drain pipes, must be of either properly tested cast iron or of best quality vitrified clay or cement, every such pipe inside such a building, or within a cellar wall, or on the surface of the ground, or less than three feet below such surface, must be of iron as aforesaid, must also be of the same material wherever it may be reached by the frost and wherever it lies within ten feet of any well or cistern. All such pipes should be properly trapped.

VI. Disused or abandoned cesspools and vaults shall, when requiring it, be emptied by the occupant or owner of the land on which they stand respectively, and shall then be filled in and disinfected with loam or other proper absorbent as may be approved by the Health Officer.

VII. Said Health Officer shall promptly condemn and order removed all defective or worn out material of the drains, pipes, cesspools, vaults and traps aforesaid, and also all work done thereon not in accordance with the provisions of these rules and regulations, or of the regulations in force from time to time in said District of Narragansett, for opening or entering or connecting drains with public sewers.

VIII. He shall also order the repair, reconstruction, or renovation of said material and work so far as may be needful, and within such reasonable time as the Council may appoint. All such orders given to the owners or occupants of said structures condemned as aforesaid, on account of material or work, shall be strictly obeyed.

IX. No disused or abandoned well or cistern shall be used as a receptacle for sewerage or garbage or other house water, unless the same be first reconstructed in conformity to the foregoing rules.

X. And every owner or occupant of such a well or cistern shall fill it in with loam, or other clean absorbent, upon being ordered so to do by said Health Officer.

XI. Every building used as a dwelling-house shall be furnished with at least one suitable, safely constructed water closet or with a privy or privies built as hereinbefore prescribed, and large enough to supply the necessities of the persons entitled to use the same.

XII. All waste water and all matter discharged from a water closet shall be conveyed through a sufficient drain underground to a common sewer or to a cesspool constructed as aforesaid into ground approved by said Health Officer, and no person shall suffer waste or stagnant water to remain in a cellar or upon land owned or occupied by him in the compact part of said District of Narragansett.

XIII. Whenever a vault, privy vault or cesspool becomes full or offensive, or a drain becomes obstructed, the owner or occupant of the land in which such drain, vault or cesspool is situated, shall cause the same to be emptied, cleared, and cleaned, within such reasonable time as the said Health Officer may in a notice therefor prescribe; and every privy vault and cesspool in said district shall be emptied by the owner or occupant thereof at least twice in every year within the times and in the manner legally ordained.

XIV. No fish-car, lobster-car, ark or other receptacle for fish or lobsters, shall be kept or put within one hundred and fifty feet of the mouth of any sewer.

XV. Every owner or occupant or other person who shall make, maintain or use, either alone or with another person or persons, any structure or thing contrary to or forbidden or prohibited by the foregoing rules or any part thereof, or shall in any wise violate any provision of said rules, shall be fined not less than five dollars nor more than twenty dollars for every offense.

XVI. No person shall empty the contents of any cesspool or privy vault with the intention of spreading the same upon land located in the compact part of this district without the written permit of the Health Officer.

OFFENSIVE ODORS AND LIQUIDS.

XVII. No person shall permit or have any offensive water, or other liquid or substance on his premises or grounds to the prejudice of life or health, whether for use in trade or otherwise.

XVIII. No person shall boil any offal, swill, bones or fat in the compact part of said district, save in ordinary cooking, nor shall the business of bone crushing, bone boiling, bone grinding, bone burning, shell burning, fat burning, gut cleaning, nor the skinning or making of glue from any dead animals or parts thereof, nor any other occupation that is dangerous or detrimental to life or health be hereafter established within said district; and no business or pursuit of the kind in this section named shall be carried on anywhere in said district, unless the same be allowed by permit of the Council.

XIX. No hotel, tavern, or boarding-house proprietor or other house-holder, shall permit garbage, or other decaying animal or vegetable matter to accumulate about his or her premises in this district. All such garbage must be contained in properly constructed receptacles, capable of being kept clean and

wholesome, and must be removed at least twice in the week and as much oftener as the Health Officer may require to the ground provided for that purpose.

XX. Every owner, lessee and occupant of any stable or apartment in which any horse, cattle or swine or any animal be kept within the compact part of the district, shall cause the manure accumulating to be removed to some proper place, and shall at all times keep, or cause to be kept, such stalls, stables or apartments in a cleanly and wholesome condition so that no offensive smell detrimental to health shall be allowed to escape therefrom.

XXI. No pile or deposit of manure, offal, dirt or garbage, or any accumulation of any nauseous substance shall be made within the compact part of this district, at any time after the first day of May, and before the first day of November in each year.

XXII. In or near any livery stable, by special permit of the Health Officer, manure may be permitted to accumulate to a quantity not to exceed three cord.

XXIII. No person shall permit the drainage from any stable, privy, laundry or sink to flow into any open pond or water course in this district.

XXIV. No garbage, manure, or anything whatsoever, which may be, by contaminating the water, detrimental to health, shall be thrown into or deposited in any pond or water course in this district. Any person who shall violate this ordinance shall be liable to a fine of fifty dollars.

XXV. No person owning, occupying or having charge of any stable or other premises shall keep or allow thereon or therein any dog or other animal which shall by noise disturb the quiet or repose of those or anyone therein or in the vicinity, to the detriment of the life or health of any human being.

DISEASED ANIMALS.

XXVI. No diseased or sickly horse, cattle, swine, sheep, dog or cat or other animals, nor any that have been exposed to any disease that is contagious among such animals shall be brought into this district.

XXVII. No person having a dead animal or any animal past recovery, and not killed for and proper for use as meat or fish, or in any offensive condition, or sick with an infectious or contagious disease on his premises in said district, and every person whose animal or any animals in his charge or under his control in any street or place may die or become or be in a condition past recovery, shall at once remove or cause the removal of such animal, dead or alive, to some proper place, and, when such place may be designated by the Health Officer, to the place so designated.

DEAD, SICK AND INJURED ANIMALS.

XXVIII. No person shall leave in or throw into any place or street, or public water, nor offensively expose or bury the body (or any part thereof) of any dead or fatally sick or injured animal; nor shall any person keep any dead animal or offensive meat, bird, fowl or fish in a place where the same may be dangerous to the life or detrimental to the health of any person.

HYDROPHOBIA.

XXIX. Every animal which is mad or has the hydrophobia, or shows symptoms thereof, shall, by the persons owning the same or having the possession, charge or control thereof, be at once killed upon the certificate of the Health Officer that the animal is afflicted with Rabies, and every animal that has been exposed to such disease shall be at once confined in some secure place for such length of time as to show that such exposure has not given such animal said disease and so as to avoid all danger to life or health. And the dead body of any animal that died of such disease shall be at once, by such person, buried not less than three feet under ground, at some place not within one thousand feet of any residence.

The Public Statutes and Public Laws of the State in relation to the sale of Milk, shall be enforced.

RULES FOR THE PREVENTION OF THE SPREAD OF CONTAGIOUS DISEASES.

XXXIV. Every physician having knowledge of any cases of contagious, infectious or epidemic disease within the District of Narragansett, shall immediately make a report thereof in writing to the Health Officer of said district, with such particulars as the said officers may indicate on blanks furnished for that purpose.

XXXV. The diseases referred to in the preceding section shall include cholera, yellow fever, typhus fever, typhoid fever, cerebro-spinal meningitis, diphtheria, small-pox, scarlet fever, and such other contagious, infectious or epidemic diseases, as the Health Officer may from time to time direct.

XXXVI. Any physician who shall fail to comply with the preceding regulations shall be fined not less than two dollars nor more than ten dollars for each day of such neglect after having knowledge thereof as aforesaid.

XXXVII. No person living in a family where there is a case of small-pox shall attend school until the patient shall have passed the period of dissipation (falling off of scabs) and until the house has been properly fumigated.

XXXVIII. No person living in a family where there is a case of diphtheria shall attend school until one week after the recovery of the patient, and until the house has been properly fumigated.

XXXIX. The above rules shall, when deemed necessary by the Health Officer, be extended to all persons living in the same house where the above diseases exist, and when he deems necessary the Health Officer may extend the period of isolation specified in the foregoing sections.

XL. A certificate from the Health Officer stating that the required time has elapsed and that fumigation has been properly performed, will be required by the teacher before the persons referred to in the foregoing sections can be admitted to schools.

XLI. No person with measles, whooping cough, mumps or chicken-pox shall attend school until complete recovery.

XLII. The funeral of any person who has died of small-pox, diphtheria, scarlet fever, or Asiatic cholera, shall be private; and no person having the care or custody of the body of any person who has died of the above diseases shall do, or knowingly or wilfully permit to be done any unnecessary act by which spread of disease from such dead body may be caused or promoted.

XLIII. Any person who shall violate any provision of the next preceding rule shall upon conviction thereof pay a fine of not more than twenty dollars or be imprisoned not exceeding ten days, and any undertaker who shall violate any provision of said rule, upon conviction thereof, shall, in addition to the above penalty, be thereupon and thereby removed from the office of undertaker.

XLIV. That every physician, midwife and other person who may professionally assist or advise at any birth, shall make and keep a registry of every such birth, and therein enter the time and place of such birth and the sex and color of every child born, and the names and residence of each of the parents (so far as the foregoing facts can be ascertained) and report the same to the Health Officer within the first week of each month following the birth.

XLV. That no new burying ground, cemetery, tomb or vault for dead human bodies, shall be established, nor shall the remains of any dead body be placed in any existing burying ground, vault, tomb or cemetery, without a written permit from the Council.

XLVI. That no person shall retain, expose, or allow to be retained or exposed, the dead body of any human being to the peril or prejudice of the life or health of any person.

REMOVALS OF SICK PERSONS.

XLVII. That no person shall, within this district, without a permit from the Health Officer, carry, remove, or cause or permit to be carried or removed, any person sick with small-pox or other contagious disease, or remove, or cause to be removed, any such person from any building or vessel to any other building or vessel, or to the shore, or to or from any vehicle in any part of the district. Nor shall any person by any exposure of any individual sick of any contagious disease, or of the body of such person, or by any negligent act connected therewith, or in any respect of the care or custody thereof, or by a needless exposure of himself cause or contribute to or promote the spread of disease from any such person or from any dead body.

XLVIII. That no person shall bring into this district from any infected place or land, or taken therein from any vessel lately from any infected port, or from any vessel or building in which had lately been any person sick of a contagious disease, any article or person whatsoever, nor shall any person land or come into said district without a permit of the Health Officer.

COMPULSORY VACCINATION.

XLIX. Every parent or guardian, or person having the care, custody or control of any minor or other individual shall (to the extent of any means, power and authority of said parent, guardian or other person, that could properly be

used or exerted for such purpose,) cause such minor or individual to be properly vaccinated, unless satisfactory evidence is shown that within five years such minor or individual has been successfully vaccinated.

DISINFECTANTS.

The infectious character of the dejections of patients suffering from cholera, and from typhoid fever is well established—and this in that of mild cases and of the earliest stages of these diseases, as well as of severe and fatal cases. It is probable that epidemic dysentery, tuberculosis, and perhaps diphtheria, yellow fever, scarlet fever, and typhus fever may also be transmitted by means of the alvine discharges of the sick. It is therefore of the first importance that these should be disinfected. In cholera, diphtheria, yellow fever and scarlet fever, all vomited material should be looked upon as infectious, and in tuberculosis, diphtheria, scarlet fever and infectious pneumonia, the sputa of the sick should be disinfected or destroyed by fire.

It seems advisable also to treat the urine of patients sick with an infectious disease with one of the disinfecting solutions below recommended.

Chloride of lime, or bleaching powder, is, perhaps, entitled to the first place for disinfecting excreta, on account of the rapidity of its action. The following standard solution is recommended :

STANDARD SOLUTION, NO. 1.

Dissolve Chloride of Lime of the best quality in soft water, in the proportion of four ounces to the gallon.

Use one pint of this solution for the disinfection of each discharge in cholera, typhoid fever, etc. Mix well and leave in vessel for at least ten minutes before throwing into privy-vault or water-closet. The same directions apply for the disinfection of vomited matters. Infected sputum should be discharged directly into a cup half full of the solution.

STANDARD SOLUTION, NO. 2.

Dissolve Corrosive Sublimate and Permanganate of Potash in soft water, in the proportion of two drams of each salt to the gallon.

This is to be used for the same purposes and in the same way as *Standard Solution, No. 1*. It is equally effective, but it is necessary to leave it for a longer time in contact with the material to be disinfected—at least an hour. The only advantage which this solution has over the chloride of lime solution consists in the fact that it is odorless ; while the odor of chlorine in the sick room is considered by some objectionable. The cost is about the same. It must be remembered that this solution is highly poisonous. It is proper, also, to call attention to the fact that *it will injure lead pipes if passed through them in considerable quantities.*

STANDARD SOLUTION, NO. 3.

To one part of Labarraque's Solution (liquor sodæ chlorinæ), add five parts of soft water.

This solution is more expensive than the solution of chloride of lime, and has

no special advantages for the purposes mentioned. It may, however, be used in the same manner as recommended for *Standard Solution, No. 1.*

The following powder is also recommended for the disinfection of excreta in the sick room and of privy-vaults, etc.:

DISINFECTING AND ANTISEPTIC POWDER.

One pound of Chloride of Lime; one ounce of Corrosive Sublimate; nine pounds of Plaster of Paris. Pulverize the Corrosive Sublimate and mix thoroughly with the Plaster of Paris. Then add the Chloride of Lime and mix well. Pack in paste-board boxes or in wooden casks. Keep dry.

As an antiseptic and deodorizer this powder is to be sprinkled upon the surface of excreta, etc.

To disinfect excreta in the sick room, cover the entire surface with a thin layer of the powder—one-fourth inch in thickness—and if the material is not liquid pour on sufficient water to cover it.

DISINFECTION OF THE PERSON.

The surface of the body of a sick person, or of his attendants, when soiled with infectious discharges should be at once cleaned with a suitable disinfecting agent. For this purpose *Standard Solution, No. 3,* may be used.

In diseases like small-pox and scarlet fever, in which the infectious agent is given off from the entire surface of the body, occasional ablutions with Labarraque's Solution, diluted with twenty parts of water, will be more suitable than the stronger solution above recommended.

In all infectious diseases the surface of the body of the dead should be thoroughly washed with one of the standard solutions above recommended, and then enveloped in a sheet saturated with the same.

DISINFECTION OF CLOTHING.

Boiling for half an hour will destroy the vitality of all known disease germs, and there is no better way of disinfecting clothing or bedding which can be washed than to put it through the ordinary operations of the laundry. No delay should occur, however, between the time of removing soiled clothing from the person or bed of the sick and its immersion in boiling water, or in one of the following solutions; and no article should be permitted to leave the room until so treated.

STANDARD SOLUTION, NO. 4.

Dissolve Corrosive Sublimate in water in the proportion of four ounces to the gallon, and add one drachm of Permanganate of Potash to each gallon to give color to the solution.*

One fluid ounce of this standard solution to the gallon of water will make a suitable solution for the disinfection of clothing.

The articles to be disinfected must be thoroughly soaked with the disinfecting solution and left in it for at least two hours, after which they may be wrung out and sent to the wash.

*Mercuric chloride (corrosive sublimate) is soluble in cold water in the proportion of one part in sixteen. Solution is greatly facilitated by heat.

N. B.—Solution of Corrosive Sublimate should not be placed in metal receptacles. A wooden tub or earthen crock is a suitable receptacle.

Clothing may also be disinfected by immersion for two hours in a solution made by diluting Standard Solution, No. 1, with 9 parts water—one gallon in ten.

This solution is preferable to the poisonous solution made from Standard Solution, No. 4.

Clothing and bedding which cannot be washed may be disinfected by exposure to dry heat, in a properly constructed disinfecting chamber for three or four hours. A temperature of 23° Fah. should be maintained and the clothing must be freely exposed.

AGENTS THAT MAY BE USED FOR DISINFECTION.

Heat.—Destruction by burning.

“ Steam under pressure (230° Fah.) ten minutes.

“ Boiling in water not less than one-half hour.

“ Dry heat, oven or furnace, (230° Fah.) two hours.

Chloride of Lime, 1 part to from 4 to 9 of Plaster of Paris.

Chloride of Lime, Solution, 1 oz. to quart of water.

Corrosive Sublimate, Solution, 1 drachm to the gallon of water. For very strong, 4 oz. to the gallon. See Standard Solutions, Nos. 2 and 4, and remarks.

STANDARD SOLUTION, NO. 5.

(Or Blue Solution.)

Dissolve four ounces of Corrosive Sublimate and one pound of Blue Vitrol in a gallon of hot water.

One-half pint of this solution to one gallon of water when used for disinfecting excreta in the sick room. Preferable in some cases to chlorides of lime or soda because odorless.

Chloride of Zinc, Sol. 5 to 10 per cent. More costly and no more valuable than chloride of lime. Has no odor.

FOR CLOTHING, BEDDING, &C.

(a) Soiled underclothing, bed linen, &c., (1) destruction by fire, if of little value; (2) boiling for at least half an hour; (3) immersion in a solution of mercuric chloride (corrosive sublimate), of the strength of 1 : 2,000 (1 drachm to 1 gallon of water) for four hours; (4) immersion in a 2 per cent. solution of carbolic acid for four hours.

(b) Outer garments of wool or silk, and similar articles, which would be injured by immersion in boiling water or in a disinfecting solution, (1) exposure to dry heat at a temperature of 110° C. (230° Fah.) for 2 hours; (2) fumigation with sulphurous acid gas* for at least twelve hours, the clothing being freely exposed.

(c) Mattresses and blankets soiled by the discharges of the sick, (1) destruction by fire; (2) exposure to super-heated steam—25 pounds pressure—for one

* Fumes or vapor of burning sulphur.

hour (mattresses to have the cover removed or freely opened); (3) immersion in boiling water for one hour; (4) immersion in the blue solution (mercuric chloride and sulphate of copper), two fluid ounces to the gallon of water.

Furniture and articles of wood, leather and porcelain.*—Washing, several times repeated, with: (1) Solution of mercuric chloride, 1: 1,000 (the blue solution, 4 ounces to the gallon of water, may be used); (2) solution of chloride of lime, 1 per cent.; (3) solution of carbolic acid, 2 per cent.

For the person—The hands and general surface of the body of attendants, of the sick, and of convalescents at the time of their discharge: (1) Solution of chlorinated soda diluted with nine parts of water (1. 10); (2) carbolic acid, 2 per cent. solution; (3) mercuric chloride, 1: 1,000 (1 drachm to 2 gallons of water)—recommended only for the hands, or for washing away infectious material from a limited area, not as a bath for the entire surface of the body.

For the dead.—Envelope the body in a sheet thoroughly saturated with: (1) Chloride of lime in solution, 4 per cent.; (2) mercuric chloride in solution, 1: 500 (1 drachm to 1 quart of water); (3) carbolic acid in solution, 5 per cent.

For the sick room and hospital wards.—(a) While occupied, wash all surfaces with: (1) Mercuric chloride in solution, 1: 1,000 (the blue solution, containing sulphate of copper, may be used); (2) chloride of lime in solution, 1 per cent.; (3) carbolic acid in solution, 2 per cent.

(b) When vacated fumigate with sulphur dioxide and fumes of burning sulphur for 12 hours, burning 3 pounds of sulphur—for every 1,000 cubic feet of air space in the room—then wash all surfaces with one of the above mentioned disinfecting solutions, and afterward with soap and hot water; finally throw open doors and windows and ventilate freely.

NORTH KINGSTOWN.

1. No work for the promotion of public health especially.
2. No introduction or extension of water for general use.
3. No public sewerage.
4. No new ordinances for any sanitary purposes. Town health ordinances published in last State Board of Health Report, 1888.
5. Board of health, the town council.
6. Health Officer, Thomas W. Peirce.
7. No gratuitous vaccination provided during the past year.
8. Undertakers have not promptly sent in their returns of death.

GEORGE T. CRANSTON, *Town Clerk*.

SOUTH KINGSTOWN.

1. Water works completed. System of sewers contemplated.
2. Wakefield Water Works Company. Supplies Wakefield, Peacedale and Narragansett Pier. See letter of Superintendent appended.

* For metallic utensils use Standard Solution, No. 3.

3. No public sewerage.
4. See ordinance appended.
5. Board of health, the town council.
6. Health officers not appointed.
7. As required by law, school children are vaccinated by physicians at school houses.
8. Undertakers have promptly sent in their returns of death.

H. B. PERRY, *Town Clerk.*

AN ORDINANCE TO RESTRICT THE SPREAD OF CONTAGIOUS OR
INFECTIOUS DISEASES.

It is ordained by the Town Council of the Town of South Kingstown, as follows :

SECTION 1. No person shall attend the Public Schools of this town as teacher, pupil, or in any other capacity, if such person resides in, or has resided in any house, tenement or family, in which there is or has been a case of small-pox, varioloid, cholera, scarlet fever, diphtheria, whooping cough or measles, within the period of four weeks from the commencement of the last existing case, in such house, tenement or family of any such disease.

SEC. 2. Whenever it shall come to the knowledge of any teacher in the Public Schools, that any pupil is in attendance in violation of the preceding section, the said teacher shall forthwith forbid such attendance and give notice immediately of the occurrence, to the Health Officer.

SEC. 3. Every person violating the provisions of either of the preceding sections, shall be fined not exceeding five dollars for every day of such violation.

A true copy,

H. B. PERRY, *Clerk.*

OFFICE WAKEFIELD WATER CO., NARRAGANSETT PIER.

Charles H. Fisher, M. D., Secretary State Board of Health, Rhode Island :

DEAR SIR :—Your postal of the 27th instant, requesting our report for 1889, if printed, or if not the extensions and number of persons supplied during and at end of 1889, received.

Our plant, which covers an area of about 14 miles of piping, was only completed December 30, 1889. Up to and at that time, we had 130 taps in use ; the number of persons supplied I am unable to say, as the taps are made for dwellings, stores, offices, &c.

Very respectfully,

E. A. WATERHOUSE, *Superintendent.*

RICHMOND.

1. No work for the promotion of public health.
2. No water service for general use.
3. Have no public sewerage.
4. Nothing new in abatement of nuisances or sanitary improvement.

5. Board of health, the town council.
6. Health Officer, A. H. Ecclestone, M. D.
7. No gratuitous vaccination provided during the past year.

H. P. CLARKE, *Town Clerk.*

WESTERLY.

1. Only the usual work for the promotion of public health contemplated by the town authorities during the year.
2. Do not know the proportion of the population supplied with public water at the end of the year.
3. No public sewerage.
5. Board of health, the town council.
6. H. W. Rose, Superintendent of Health, Benjamin York, Health Officer.
7. Gratuitous vaccination was provided during the past year. The proportion of the population vaccinated, according to my best knowledge, was about 900.
8. As a rule, undertakers promptly send in their returns of death.

W. HOXSEY, *Town Clerk.*

WESTERLY WATER WORKS,

WESTERLY, R. I., March 28, 1890.

Charles H. Fisher, Secretary State Board of Health, Providence, R. I. :

DEAR SIR :—Your communication of the 27th inst. at hand. In reply would state that we do not print a public report. Our extensions in 1889 were 1,617 feet. As near as I can estimate, 2,000 persons are daily using water supplied by this concern.

Yours very truly,

EVERETT BARNES, *Superintendent.*

REPORTS OF
HEALTH OFFICERS.

1889.

CIRCULAR TO HEALTH OFFICERS.

In order to ascertain what degree of interest was taken in the work of sanitary inspection, and what had been accomplished in the different towns by the Health Officers of the same during 1889, the following circulars were sent at the close of the year :

CIRCULAR No. 106.

OFFICE OF SECRETARY OF THE STATE BOARD OF HEALTH,

PROVIDENCE, Dec. 26, 1889.

To the Health Officer of

DEAR SIR :—An important feature of the Annual Reports of the Rhode Island State Board of Health is that of giving a connected history of the occurrence of contagious and epidemic diseases from year to year, as they may have prevailed in the different towns, whether epidemically or in a less degree, together with the location in the town (village or otherwise), and season of the year.

If the proportion of the fatal cases to the whole number of cases of the same disease could be given, the value of such reports would be very much enhanced. Such proportion can be ascertained only in such towns as *by town ordinance* require physicians to report all cases of such diseases as come within their charge.

An approximate proportion can, however, be given, after the subsidence of the disease, by inquiry of persons living in the immediate neighborhood of the prevalence of such disease as to the number of the sick, or by house to house visitation where the sickness occurred, with same inquiry, and by the comparison of the deaths with recoveries as so ascertained.

Another feature of the Reports is a yearly record of the sanitary improvements made in the towns, in relation to water supply, drainage, abatement of nuisances, better methods of heating and ventilating public buildings, and such new ordinances as may have been adopted, having in view the improvement of the public health, the data for which is mainly obtained from the town and city clerks.

It is for the purpose of ascertaining additional and supplementary information that the questions in the inclosed circular are sent to the various Health Officers of the State,

If, therefore, you will have the kindness to reply to the questions in the said circular, according to the best knowledge you have been able to obtain, and forward in the enclosed stamped envelope, you will favor one of the most important interests of the State, and greatly oblige,

Yours truly,

CHAS. H. FISHER,

Sec. State Board of Health.

P. S.—In the replies on the blank circular of questions, in relation to the extent or degree of prevalence of any disease, the following signs may be used :

The star (*) preceding the name of any disease will indicate an epidemic prevalence ; the sign plus (+), a large prevalence ; and the sign equals (=), a moderate prevalence.

To Health Officers who are not physicians, it may be said that the term epidemic, within the meaning of the questions proposed, is the prevalence of some disease to the extent of one or more persons affected with the disease to every five or six persons living in adjacent tenements or in the near neighborhood, or a smaller proportion, not less than one case of the disease in every ten or twelve of the population, extending over a large area of territory. One sick in every twelve to sixteen persons might be called a large prevalence, and one sick in every twenty to twenty-five, a moderate prevalence. The number of cases of any one disease may have to be estimated, but make them as nearly correct as possible.

C. H. F.

CIRCULAR No. 107.

DEAR SIR :—Replies to the following questions, as suggested in the accompanying circular, (No. 106), are respectfully solicited ; said replies to be made on this circular, following each question :

1. Name of Town.

2. Name of Health Officer.

3. Have there been, within your knowledge, any epidemics, or any large prevalence of contagious or infectious diseases in your town during 1889 ? If so, of what disease or diseases ? in what locality or localities ? how many of each disease ? * and in what months of the year ?

* According to the best knowledge obtainable.

Diseases.	Locality.	No. of Cases.	No. of Deaths.	Months in which they occurred.

4. Was isolation maintained or attempted ? *

5. What proportion of the sick, if any, were isolated ?

6. Was any inspection of premises made, where sickness prevailed, as to the sanitary condition of the cellars, pantries, sinks, sink-drains, water-closets, if any, cesspools, out-house privies, distance of wells from accumulations of filth, etc., etc. ? If so, please give a general statement as to whether they were sanitarily in conditions, good or bad, or if any thing or place was unusually unsanitary, give a full description. Or if the cause of any outbreak of disease was found, please state what ?

7. Did you make any sanitary inspections during 1889, by order of the town council or from your own option ? If so, what were they and how made ?

8. Do you know of any location in your town that seems to be particularly unhealthy to any considerable number of persons ? If so, and the cause is suspected, can such cause be removed at any reasonable expense ?

9. Do you report to your town council nuisances dangerous to the public health, or unsanitary premises within your knowledge ; or of buildings unsafe for occupants in case of fire ? (See Chapter 495, Section 6, Public Laws.)

10. Have you knowledge that any serious disease of domestic animals has largely prevailed in your town during the year ? If so, what disease or diseases, and in what locality ?

Have you a copy of the "Manual for the Health Officers of Rhode Island" at hand ? If not, one will be forwarded immediately, or more, if desired.

* According to the best knowledge obtainable.

REPLIES OF HEALTH OFFICERS.

BRISTOL COUNTY.

1. BRISTOL.

2. Health Officer, George H. Peck.

3. There has been some prevalence of the following contagious or infectious diseases in town during 1889 :

Typhoid fever ; scattered ; 10 cases ; 1 death ; February, 2 ; July, 1 ; August, 3 ; September, 2 ; November, 1 ; December, 1. Scarlatina ; suburbs ; 8 cases ; no deaths ; January, 5 ; February, 1 ; October, 2. Scarlet fever ; compact part of town ; 10 cases ; no deaths ; January, 8 ; March, 1 ; April, 1. Diphtheria ; compact part of town ; 1 case ; July. Measles ; compact part of town ; 1 case ; September. Chicken-pox ; compact part of town ; 1 case ; April. None of the last three mentioned diseases were fatal.

4. Isolation was maintained.

5. About one-half of the sick were isolated.

6. I have kept well informed of accumulations of filth, and promptly caused them to be removed. There have been none of a serious nature ; the few cases of contagious diseases have occurred where the sanitary conditions were generally fair.

7. No special sanitary inspections were made during 1889 by order of the town council.

8. No particularly unhealthy location known.

9. Should report to the town council nuisances dangerous to the public health if any were known.

10. No disease of domestic animals has largely prevailed.

BARRINGTON.

No report from the health officers.

WARREN.

Health officer made no report.

KENT COUNTY.

1. EAST GREENWICH.

2. Health Officer, J. H. Eldredge.

3. No marked epidemics of any contagious or infectious diseases in 1889,

6. No official inspections were made during 1889.

7. No inspections ordered by town authorities.

8. No known location in town that seems to be particularly unhealthy.
9. Report is made to the town council of nuisances dangerous to the public health if any are known, or if complaint is made.
10. No disease of domestic animals has largely prevailed.

COVENTRY.

No report from health officers.

WEST GREENWICH.

No report from health officers.

1. WARWICK.

2. Health Officer, Albert G. Sprague, M. D.

3. The following contagious or infectious diseases have prevailed in this town during 1889 :

Scarlet fever : Phenix, River Point and vicinity ; a few cases ; Spring and Summer. Measles ; Phenix, River Point and vicinity ; very prevalent ; mild. Influenza (La Grippe) ; all over the town to an alarming extent ; no deaths ; during last week in December.

4. No isolation maintained.

6. Inspections of premises were made, to a considerable number, as to the sanitary condition of sink-drains, cesspools, out-house privies, distance of wells from accumulations of filth, etc. Some of the places were found to be very filthy, and I ordered them to be cleaned.

7. Inspections were made mostly on complaint of individuals, and the nuisances were abated in every case.

8. No location in town that seems to be particularly unhealthy to any considerable number of persons.

9. Should report to the town council any extensive nuisances dangerous to the public health upon first known occurrence.

10. No serious disease of domestic animals has largely prevailed.

NEWPORT COUNTY.

1. JAMESTOWN.

2. Health Officer, Abbott Chandler.

3. No epidemics or any large prevalence of contagious or infectious diseases in this town during 1889.

7. I made inspections at my own option. I inspected the sink-drains, water closets, cesspools, privies, back yards and cellars of the hotels and lodging-houses.

8. No location in town that seems to be particularly unhealthy to my knowledge.

9. I should report to the town council nuisances dangerous to the public health, or unsanitary premises, or buildings unsafe for occupants in case of fire, if any were known to me.

10. No serious disease of domestic animals has largely prevailed.

1. MIDDLETOWN.

2. Health Officer, John Peckham.

3. The following contagious or infectious diseases have prevailed in town during 1889 :

Scarlet fever ; 5 cases ; no deaths ; April. Diphtheria ; 1 case ; September. The above are all the cases of which I have any knowledge. There is no ordinance of council obliging doctors to report to me or any one. I have tried for the last year, and hope for some action sometime.

4. Isolation was maintained as soon as cases were known.

5. All of the sick were isolated. The cases of scarlet fever were very light, all from one case contracted in Newport. The case of diphtheria was supposed to have been contracted in traveling ; other children in the house did not take it.

7. I visited where the case of diphtheria was, with one of the town council, and found everything on the premises in good order.

8. Do not think any place particularly unhealthy.

9. Should report to the town council nuisances dangerous to the public health soon as known.

10. No serious disease of domestic animals has occurred.

NEWPORT CITY.

Henry E. Turner, Jr., Executive Officer of the Board of Health. (See page 52.)

The following are extracts from the Report of Dr. F. H. Rankin, Secretary of the Newport Board of Health :

HEALTH OF THE CITY.

We feel that the city is to be congratulated upon the general good health that has prevailed within its limits during the year, and also upon its immunity from any extended epidemic of infectious diseases. A review of the statistical tables herewith presented, places Newport in an enviable light as to its degree of healthfulness, and shows that few cities have as low a general death rate, as low a death rate from zymotic diseases, as small a percentage of deaths among children under five years of age, and as few deaths from consumption ; all of which is indicative of a more than the average good state of sanitation. Notwithstanding this laudatory statement, the guardians of the city's health should not rest satisfied with the present low mortality, for, blessed as the city is, with physical conditions unusually favorable to health, our general death rate and deaths from zymotic diseases should be much lower.

During the year 1889 there were 319 deaths, exclusive of still-births, reported in the city, an equivalent to an annual death rate of 14.3 per 1,000 inhabitants, based upon the estimated population of 22,500. The population in 1888 was

given as 22,000. In forming the estimate for 1889, the average excess (for several years) of 300 births over deaths, has been added to the figures of the previous year. The mortality among children under five years of age was 77, an equivalent to a death rate of 24.1 per cent. of the total mortality; a record that few cities can surpass. Among the aged, 83 decedents out of the total 319, passed the allotted time to man of three score years and ten; or 23.1 per cent. of decedents had passed the age of 70 years.

The mortality from consumption during the year was lower than the average of the previous ten years, although in excess of 1888. Thirty-six deaths were reported from this disease, an equivalent to a death rate of 1.66 per thousand inhabitants, a record bespeaking of good climatic influence for our city. The average age of decedents from consumption was 35 years, 10 months, 20 days. The average age of the total decedents for the year was 41 years, 11 months, 7 days.

An indication of the healthfulness of Newport as a summer resort may perhaps be judged from the fact that but ten (10) deaths occurred among the eight or nine or possible ten thousand transient residents of all classes who were with us during the summer months, and of this number there was but one death under five years of age.

ZYMOTIC DISEASES.

Our death record from zymotic or germ diseases for the past year is exceedingly favorable and is one that is equalled by few cities. The total number of deaths under this class was 46, or 14 per cent. of the total death rate and 2.06 deaths per 1,000 inhabitants, a lower record than we have had for a number of years.

The following are the most prominent causes of deaths in this class:

Diphtheria, Croup and Tonsillitis.—There were 9 deaths from these diseases in 1889, a decrease of 11 deaths from 1888.

Typhoid Fever.—During the year 1889, twenty-three cases of typhoid fever were reported to the Board of Health, as having originated within the city limits, with two deaths therefrom. In addition to these, however, were thirteen cases from the United States School Ship New Hampshire, with five deaths therefrom, and ten cases imported into Newport; a total of forty-six cases and seven deaths. By imported cases is understood, patients who came to Newport in a debilitated condition in quest of health, and were taken ill within a week or ten days after their arrival, it being evident upon investigation that the disease was contracted elsewhere. The thirteen cases from the New Hampshire, caused by the unsanitary surroundings of the school ship which was anchored close to the shore of Coaster's Harbor Island, should not properly be included in the total number of cases, since the patients were taken ill on board ship, and not in habitations on shore. Local sanitary defects were found to exist in every case excepting three (3), where the disease originated within the city.

Diarrhœal Diseases.—There were during the year fifteen deaths from cholera infantum, two from infantile diarrhœa, two from cholera morbus, and seven from dysentery.

Scarlet Fever —One death from this disease occurred in January. Seventeen cases were reported during the first five months of the year, but during the last seven months of the year not a single case has been known to have existed in the city.

Diseases of a contagious character have received especial attention from the Board of Health, and every care has been taken to prevent the spread of contagion. The law requiring the posting a notice of warning upon houses where contagious diseases existed has been rigidly enforced, and careful inspection made in most cases.

NEWPORT COMPARED WITH OTHER CITIES.

For many years invidious remarks about the unhealthfulness of Newport and its sanitary condition have been circulated by the press and passed from person to person. That this adverse criticism has been advanced without facts to substantiate the statements, can best be shown by the following table, in the study of which it must be remembered that it is only by comparison that a correct judgment can be formed as to any degree of perfection.

The healthfulness and sanitary condition of a city can be very accurately determined by a consideration of three classes of figures from its mortuary statistics, viz : The general death rate, the death rate from zymotic diseases and the percentage of deaths among children under five years of age. The general death rate is in a measure an index of the general amount of illness. Since for every death there must necessarily be a certain percentage of cases of illness, it naturally follows that the lower the mortality the less the amount of illness. The death rate from zymotic diseases and the number of deaths among children under five years of age may be looked upon as an exponent of the state of sanitation in the various cities, for the reason that filth and unsanitary conditions are the chief causes for augmenting their mortality.

With this brief explanation the value of the figures in the following table will be appreciated, and the relative position of Newport for healthfulness and sanitation may be ascertained :

COMPARATIVE DEATH RATES, 1888.

	Rate per 1,000 of population.	Deaths from zymotic causes per 1,000 of population.	Percentage of Deaths under 5 years to total mortality.	Deaths from Consumption per 1,000 of population.
NEWPORT, R. I.....	14.3	3.1	31.4	1.14
Newark, N. J.	28.58	4.54	42.15	2.4
Memphis, Tenn.	27.75	6.7	30.	3.8
New York, N. Y.	26.32	....	43.2	3.44
Poughkeepsie, N. Y.....	25.1	5.7	32	2.35
Boston, Mass.....	24.57	3.52	35.29	3.53
Philadelphia, Pa.	23.9	....	35.67	2.65
Burlington, Vt.....	23.44	5.69	52.53	2.13
Fall River, Mass.....	23.12	5.65	47.5	3.14
Concord, N. H.....	22.8	3.87	26.9	2.33
Salem, Mass.	22.2	....	29.	1.92
Cambridge, Mass.....	21.69	5.18	45.	2.65
Brooklyn, N. Y.....	21.38	5.7	44.39	2.54
Providence, R. I.	21.20	5.44	29.52	2.92
Hartford, Conn.	21.08	4.6	45.7	2.7
Manchester, N. H.....	20.8	5.33	46.54	2.66
St. Louis, Mo.....	20.71	4.85	40.14	1.82
Scranton, Pa.	20.24	43.54	....	.89
Richmond, Va.....	19.71	2.67	37.34	2.45
New Bedford, Mass.....	19.67	....	34.51	2.01
New Haven, Conn.....	19.4	4.83	33.6	2.64
Haverhill, Mass.....	19.36	3.28	33.88	3.08
Newburgh, N. Y.....	18.76	4.8	35.2	2.52
Syracuse, N. Y.	18.46	4.1	35.77	2.71
Lynn, Mass.....	18.06	2.96	35.39	2.74
Denver, Colorado....	18.	4.54	34.18	*3.
New Britain, Conn.....	17.95	....	34.82	....
Baltimore, Md.....	17.86	3.92	43.43	2.3
San Francisco, Cal.....	17.86	1.93	25.8	3.13
Taunton, Mass.....	17.15	2.45	27.53	2.11
Somerville, Mass.	16.9	3.5	....	2.28
Utica, N. Y.	16.88	4.08	29.8	2.1
Nashville, Tenn.....	16.36	3.56	34.15	2.63
Altoona, Pa.....	16.13	....	48.34	.37
Portland, Me.....	16.05	1.65	24.14	2.75
Auburn, N. Y.....	15.8	....	22.38	....
Brockton, Mass.....	14.48	....	39.	1.88
Reading, Pa.....	14.25	3.43	38.76	1.73
Toledo, Ohio.....	13.71	2.97	40.65	1.58
Davenport, Iowa.....	12.5	4.92	37.2	.92
Keokuk, Iowa.....	10.94	....	....	1.69
Grand Rapids, Mich.....	10.89	1.87	40.51	1.37
NEWPORT, R. I., 1889....	14.3	2.06	24.1	1.66

* Denver, a resort for consumptives.

SANITARY CONSIDERATIONS.

The interest that has been evinced during the past year in the extension of sewers throughout the city, in the providing adequate means for the disposal of garbage, and in the consideration of the best method for the removal and disposal of night soil, bears evidence of a full realization of the importance of sanitary reforms, and of a desire to improve the general healthfulness of our city. It is to be regretted that the earnest efforts that have been made have not been completely crowned with success.

The Board of Health desires to testify its appreciation of the courteous attention received from the City Council in the joint conferences for the consideration of sanitary questions that called them together. The first joint meeting was called to discuss the best method for the disposal of night soil. In the further consideration of the subject by the appointed committee, an expedient way for accomplishing this, was, it is understood, decided upon but not adopted. The Board of Health, as guardians of the health and sanitary interests of the city, feel called upon to again direct the attention of your honorable body to this important question, and to urge, most earnestly, the adoption of reform measures necessary to protect the public from the evil consequences that are liable to follow the present dangerous methods of disposal of night soil.

CITY WATER.

In my report of last year brief mention was made of a filter plant built by the Newport Water Works Company for the purification of the city water supply. During the summer months just past the filter was in active operation, and its successful working was practically demonstrated by a marked improvement in the clearness and taste of the water.

The earnest effort made to increase the purity of our city water deserves a more extended notice, and I have deemed it of sufficient importance to give a description of the same.

The water supply of a city, unless obtained from artesian wells, consists mainly of water collected from the surface of the country by brooks and streams which convey it into ponds or reservoirs, from which it is distributed. This water, flowing as it does through forests and meadows, necessarily collects more or less organic matter of a vegetable origin, an excess of which renders it unwholesome. It is for the removal of this organic matter that the filters are desirable.

Few cities as yet possess adequate filters for the removal of this objectionable matter, and, therefore, it is with a feeling of no small satisfaction that we may number Newport among the fortunate minority.

The water shed that gives rise to our city supply, being very near the city limits, offers no opportunity for the water to free itself of a portion of the organic matter by oxidization, as will naturally take place when the water runs for a long distance in shallow streams with rocky beds. By reason of this, and from the character of the water shed itself, our water supply contains an excess of vegetable matter.

The means resorted to for the accomplishing of the filtration are merely an imitation of the method adopted by nature for furnishing the clear water obtained from wells and springs.

This filtration is accomplished by nature, firstly, through the instrumentality of certain earthy salts, chiefly the aluminum, which have the power to coagulate or to gather together in small masses, the organic matter contained in the water ; secondly, the entrapping or collecting of the coagulated matter in the ground near the surface, the water passing into the earth to be discharged through springs free from impurities. The organic matter that is entrapped in the earth is appropriated by plant life for nutrition. In artificial filtration, therefore, the three fundamental points to observe are : First. The coagulation of the organic matter held in solution, and that in a state of fine subdivision, by the addition to the water of a small amount of aluminum salts before it passes into the filter. Second. The entrapping or gathering of the organic coagulated mass and other materials upon a bed of sand. Third. The thorough and rapid cleansing of the filter beds as frequently as they become fouled.

These principles are all embraced in the admirable filtering process patented by Mr. Hyatt, of which the Newport filter is a modification, possessing improvements which I will point out after giving a description of the filter itself.

The filter plant consists of a series of brick tanks, six in number, and in close proximity. Each tank is twenty feet in diameter, eight feet deep, and open at the top, which is one foot above the surface of the ground.

FIG. 2.



FIG. 1.

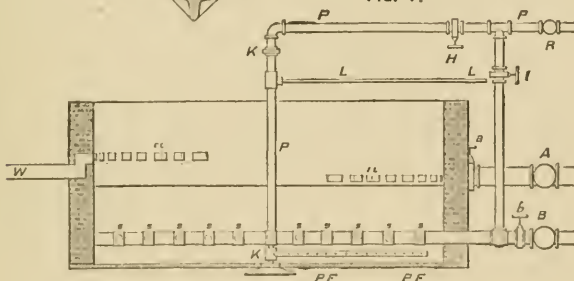


FIG. 1. Vertical section of one of the Filter tanks. A, inlet pipe from pond; I L, points of entrance of water into tank; B, outlet for filtered water; W, and OL, outlet when tank is washed; S S, screen collecting pipes; P F, revolving perforated pipe for washing sand; L L, lever arm for revolving perforated pipe; P P P, pipe from reservoir for washing tank; line through middle of tank indicates height of sand.

FIG. 2. Cross section of screen collecting pipe, showing central core of iron and wire wound around the same, with spaces for conduct of water.

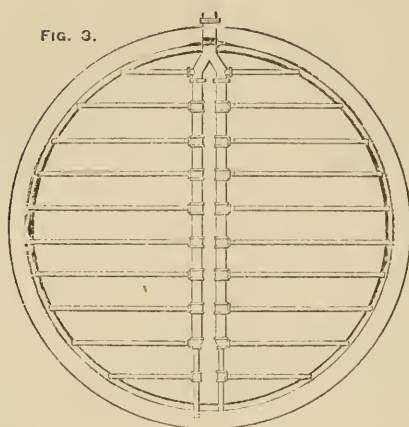


FIG. 3. Horizontal section of bottom of tank, showing arrangement of screen collecting tanks beneath the sand.

One foot from the bottom of each tank is arranged a series of collecting pipes (Fig. 1, S. S. and Fig. 3), over which is a bed of sand four feet deep. Each collecting pipe consists of a central core of iron of star shape, (Fig. 2) around which is wound a No. 12 copper wire, with an interspace of 1-5,000 of an inch between each strand, thus leaving four spaces about the central core for the collection of the water. The ends of these collecting pipes, which are ten inches in circumference, are embedded in the walls of the filter, and the centre is supported by girders from a cross beam on the top of the tank.

By means of an apparatus especially constructed, a solution of sulphate of aluminum, of definite strength, is allowed to mingle with the water in the supply pipe at a short distance before it enters each tank. The peculiar properties of the aluminum salts are quickly made manifest by an increased amount of the flocculent matter in the water. The salts gather together by coagulation, in sponge like masses of varying size, the organic matter held in the water, and thus reduces it to a condition readily to be entrapped in the sand bed of the filter. The aluminum salt becomes mingled with, and retained in, the coagulum, and remains on the filter bed, from which it is removed when the filter is washed, and consequently does not affect the water that has passed through the filter. Supply pipe A. (Fig. 1) discharges the pond water into the filter through a series of openings (I. L. Fig. 1) on the sides of the tank, about eight inches above the level of the sand. The water gravitates through four feet of fine sand to the bottom of the filter, where it is collected by pipes (Fig. 1, S. S. and Fig. 3) and discharged through the outlet pipe (B, Fig. 1) into a large and deep cistern, from which it is pumped into the city mains and into the reservoir.

This is a brief outline of the process of purifying the water. Another important step remains unfinished, i. e., the thorough cleansing of the filter beds after they have performed a certain amount of work. This cleansing process is simple and effectual, and is accomplished by a series of pipes conveying water,

under a pressure of sixty-five pounds to a square inch, from the reservoir. If we assume a tank is to be cleansed, the supply pipe from the pond and the outlet pipe are shut off by valves (a and b, Fig. 1). The gate H. is now opened, reservoir water from the pipe R. enters the wash pipe P. and is forced into the tank beneath the sand, through the perforated pipe P. F. A section of pipe P. is arranged to rotate between points K. K., thus enabling the lever arm L. to sweep the perforated pipe around the bottom of the tank beneath the sand and the collecting tubes. The water rushing through the perforation in the pipe washes a pathway before it, and thus enables the pipe to be slowly swept under the four feet of sand. The sand is thrown into violent agitation as the water is forced upwards, and all the impurities are washed to the surface. At the same time a flow of reservoir water enters through gate I. into the screen collecting tubes, and washes out any material that may have collected between the strands of wire, and assists in washing upwards the impurities collected in the sand. The water, laden with the collected organic matter and other impurities, gradually rises in the tank and flows out through openings on its side (O. L. Fig. 1), and thence in the waste pipe W, by which it is carried beyond reach of again contaminating the pond. After the washing, which requires about twenty minutes for each tank, the sand is left as clean and as pure as when first put into the tank.

Relative to the amount of water to be filtered, the Newport filter plant is the largest in the country. The main points wherein it differs from the recognized Hyatt filters are : That the filter beds are much larger in proportion to the work required, thereby allowing a slower filtration ; the water gravitates through the sand, thus rendering impossible the forcing of organic matter through the filter bed, which is likely to happen whenever pressure is used ; the sand is washed from beneath the collecting tubes, which are of a different construction.

The capacity of the pump for raising the water into the reservoir is 3,000,000 gallons per day, and the filters are designed for this amount, although capable of filtering a much larger quantity of water. The amount of water that actually passed through the filter and was used in the city during the past summer was 2,000,000 gallons a day.

The filter plant has as yet been in use only during the few months of the past summer, but as soon as further alterations, which are now being carried on have been completed, it is understood that the filter will be in use during the whole year. That there is a necessity for an uninterrupted use of the filter throughout the whole year is very apparent, for our city water contains an excess of vegetable matter.

During the period the filter was in operation experiments were constantly carried on to improve the filtration, the perfection of which depends chiefly upon the quality of sand in the filter bed, and the character and amount of aluminum salts. When these two points are satisfactorily determined, our citizens can look forward to a supply of water clear in color, and of a degree of purity that is surpassed by few cities.

The company are at present engaged in raising the height of the dam, and thereby raising the height of the water in the pond about eighteen inches. This will be an additional aid in purifying the pond water, for it will hasten the destruction of the little remaining vegetable growth along the shallow edges of the

pond, a growth which heretofore has been one of the causes of the vegetable matter in the water.

The Board of Health deem it their duty to again call the attention of your honorable body to the great importance of instituting measures for the more thorough protection of the city water shed from matter of a character which may defile the water. We recommend a sanitary inspection to be made of the city water shed, and power granted to remove all unsanitary conditions, if any exist, that are in close proximity to the streams which flow into the pond.

The company is to be commended for their enterprise and efforts to purify the water, and it certainly behooves the city to take equal interest in guarding the water from pollution, for perfect though a filter may be, it is not beyond the possibility that germs of disease having gained entrance into the water may pass through the filter.

The mortuary tables for 1890, herewith appended, exhibit the number of deaths and the causes, also the sex, color, social condition, nativity, and ages of decedents, and the number of deaths in each ward.

Respectfully submitted,

FRANCIS H. RANKIN, M. D.,

Secretary of Board of Health.

1. NEW SHOREHAM.
 2. Health Officer, Herbert S. Millikin.
 3. Only very small prevalence of contagious or infectious diseases in town during 1889, except Diphtheria, 4 cases, 2 deaths; February.
 4. Isolation was maintained.
 5. All were isolated.
 6. Inspections of premises were made where sickness prevailed as to the sanitary condition of the cellars, sinks, sink-drains, cesspools, out-house privies, distance of wells from accumulations of filth, etc. Of the places inspected the sanitary condition was found to be good.
 7. No sanitary inspections were made during 1889 by order of the town council.
 8. No known location in town that seems to be particularly unhealthy to any considerable number of persons.
 9. Should report to the town council nuisances dangerous to the public health when known.
 10. No serious disease of domestic animals has prevailed.
-
1. TIVERTON.
 2. Health Officer, none appointed, town council act.
 3. Have no knowledge of any epidemics or any large prevalence of contagious or infectious diseases during 1889.
 6. Very few inspections of premises were made during 1889.
 8. No location in town that seems to be particularly unhealthy.

9. The town council would act if nuisances dangerous to the public health were known.

10. No serious disease of domestic animals.

No report from the following towns in Newport County :

LITTLE COMPTON.

PORTSMOUTH.

PROVIDENCE COUNTY.

1. BURRILLVILLE.

2. Health Officer, Herbert F. Mowry.

3. No epidemics or any large prevalence of contagious or infectious diseases in this town during 1889 except the following :

Diphtheria, Pascoag, 5 cases, 2 deaths ; Harrisville, 3 cases, 1 death ; Mapleville, 3 cases, 1 death. Influenza, all about, scores of cases, no deaths ; December.

6. Condition of many cellars and cesspools bad. Distance of cellars from privies and sink-drains from three to ten feet in some cases. Water in some cellars.

7. I have made cases known to the town council as to sink-drains, and they gave me no answer ; they are very slack.

8. As to locations in town that seem to be unhealthy to any considerable number of persons, there are plenty, and can be removed or abated.

9. It would be of no use to report to town council nuisances dangerous to the public health, or unsanitary premises within my knowledge.

10. No serious disease of domestic animals has largely prevailed.

CRANSTON. No report.

CUMBERLAND. No report.

1. EAST PROVIDENCE.

2. Health Officer, Mason B. Wood.

3. Have no knowledge of any epidemics or any large prevalence of contagious or infectious diseases in town during 1889. There is no ordinance requiring the physicians of the town to report cases, excepting such as are in the Public Laws.

4. In cases of diphtheria, scarlet fever, whooping cough, measles and chicken-pox among school children isolation was maintained where the physicians in attendance requested me ; six cases in all.

5. I believe the proportion to be very small.

6. Inspections of premises were made as to the sanitary condition of the cellars, cesspools, out-house privies, accumulations of filth, etc. See report appended.

7. No sanitary inspections were made during 1889 by order of the town council. They were made on request of physicians or tenants.

8. Do not know of any location positively unhealthy to any considerable number of persons, although there is a place known as Carrigan's Hollow, near Fort Hill, in the village of Watchemoket, where there is a standing pool of dirty, filthy water.

10. Have no knowledge that any serious disease of domestic animals has largely prevailed during the year.

REPORT OF HEALTH OFFICER.

EAST PROVIDENCE, R. I., March 1, 1890.

To the Honorable Town Council of East Providence :

The annual report of the Health Department is herewith submitted, and is as follows:

The total number of complaints of all kinds received are 78, and may be classified as follows:

Over full and offensive privy vaults.....	6
Over full and offensive cesspools.....	16
Dead and decomposing animals.....	2
Heap of decomposing rubbish.....	9
Bad wells	2
Pig pens in bad order.....	5
Fouled stream of water.....	1
Gathering swill without permit.....	12
Carting night soil without permit.....	10
Nuisance existing in open grounds.....	15

78

Material assistance has been rendered to this department by the Police Department on all occasions where deemed necessary. There has been a general acquiescence in the suggestions and requests made by this department on the part of those complained of, so that resort to the law by prosecution has not been necessary in any instance.

There seems to be urgent need of some change in the manner of collecting and disposing of swill. At present whoever will, may take out a permit and gather swill anywhere, and at any time, as personal interest or whim may lead. Numerous complaints have been made that parties in the compact portions of the town had no way of disposing of swill accumulations.

Respectfully submitted,

MASON B. WOOD, *Health Officer.*

1. FOSTER.
2. Health Officer, Henry Arnold.

3. No large prevalence of contagious or infectious diseases in town during 1889, except Measles, scattered, 50 cases, no deaths; November and December.
4. Isolation was maintained in some instances.
5. The proportion of the sick isolated was small.
6. The sanitary condition of the cellars, pantries, &c., was found quite good.
7. No sanitary inspections made during 1889 by order of the town council.
8. No location that seems to be particularly unhealthy.
9. I should report to the town council nuisances dangerous to the public health if any were known.
10. No serious disease of domestic animals has occurred.

1. GLOCESTER.

2. Health Officer, George A. Lee.
3. No knowledge of any epidemics or any large prevalence of contagious or infectious diseases in town during 1889.
6. No inspection of premises made where sickness prevailed, as to the sanitary condition of the premises.
7. From my own option and on complaint of neighbors, I inspected a horse incompletely buried, and received promise from the owner of the land that the burial should be properly done.
8. No location in town that seems to be particularly unhealthy, so far as I know.
9. I should report to the town council nuisances dangerous to the public health.
10. No disease of domestic animals has largely prevailed.

JOHNSTON. No report.

1. LINCOLN.

2. Health Officer, Thomas F. Quigley.
3. There was a large prevalence of the following contagious or infectious diseases in town during 1889 :
Diphtheria, Lonsdale, large number of cases; 3 deaths; September and October. Malarial fevers, eastern part of town, large number of cases; no deaths; April to November.
4. Isolation was not maintained or attempted on the part of the health officer.
6. Some sanitary inspections were made and the nuisances abated.
7. The sanitary inspections made during 1889 were from my own option.
8. Do not know of any location in town that seems to be particularly unhealthy to any considerable number of persons.
9. Would make report to the town council of nuisances dangerous to the public health if such were found.
10. No serious disease of domestic animals known.

1. NORTH PROVIDENCE.

2. Health Officer, Sanford E. Kinnecom.

3. No epidemics or any large prevalence of contagious or infectious diseases in town during 1889.

7. I did inspect the premises at Lymanville and found four privy vaults and five cesspools overflowing; ordered them abated. Inspected the premises at Centredale, found three privy vaults running over, and ordered them abated. Inspected the premises at Maryville, and found one vault overflowing and the contents of night soil emptied on a vacant lot and not covered; ordered abated, repeatedly ordered abated, finally recommending an ordinance not allowing the contents of privy vaults to be brought in the town without the consent of the health officer. Passed by the town council.

9. I do report to the town council nuisances dangerous to the public health when such occur.

10. No disease of domestic animals has largely prevailed.

1. NORTH SMITHFIELD.

2. Health Officer, Joshua Wardle.

3. The following diseases were prevalent during 1889: Typhoid fever, Slatersville Village, 15 cases, 3 deaths, September and October; Forestdale Village, 11 cases, 4 deaths; September and October.

4. Isolation was not maintained or attempted.

6. Inspections of premises were made where sickness prevailed as to the sanitary condition of the cellars, sinks, sink-drains, cesspools, out-house privies, distance of wells from accumulations of filth, etc. All in fair condition, except the wells in one village. Found no cause for the outbreak that could be traced directly.

7. I did, and from my own option. Three cases in particular, where deposits from privies, etc., were left uncovered, had it buried.

8. No location in town that seems to be particularly unhealthy that I know of.

9. Should report to town council nuisances dangerous to the public health if any.

10. No disease of domestic animals known.

PAWTUCKET.

No report from the health officer.

PROVIDENCE CITY.

Superintendent of Health, Charles V. Chapin, M. D.

EXTRACTS FROM THE SUPERINTENDENT'S REPORT FOR THE YEAR ENDING
DECEMBER 31, 1889.

The number of deaths reported during the year was 2,510, which was 98 less than in the preceding year. The estimated population in 1888 was 123,000, giv-

ing a death rate of 21.20. In 1889 the estimated population was 127,000, and the death rate per thousand was 19.76, or 1.44 less than in the preceding year. This is slightly above the average for the last thirty-four years.

There were 232 deaths from diarrhœal diseases in 1889. This was 9.24 per cent. of all deaths as compared with 10.39 in the preceding year. This is 1.32 per cent. less than the average for thirty-four years.

The number of deaths among children under one year of age was 499, or 19.88 per cent. of all deaths. This was more than in any year since 1884, and slightly more than the average for thirty-four years.

There were 24 deaths from malarial diseases, or 4 more than in the preceding year, and more than in any year since 1887, when 28 deaths were reported. Nevertheless, I do not think that malaria is increasing in Providence. On the contrary, from conversation with practising physicians in various parts of the city, I am convinced that it has been decreasing for several years. The apparent increase in deaths is, I imagine, due to the tendency of physicians to attribute to malaria, cases in which it is difficult to determine the true cause, and this tendency seems to increase the longer malaria remains with us.

There were 309 deaths from consumption in 1889, which is less than any year since 1877, at which time the population was 101,000, while now it is 127,000. The percentage of the total deaths due to consumption was 12.31, or 25 per cent. less than the average for thirty-four years. It is now known with certainty that tubercular consumption is a contagious disease, due in every case to the growth in the lungs of very minute vegetable organisms called tubercle *bacilli*. These organisms are thrown off from the lungs in the sputum, and live for a considerable time outside the body. They may be carried about in various ways, probably most frequently in the air. If a person who may happen to inhale them is in feeble health, or has a poor constitution, the germs are very liable to grow and produce a case of the disease. People with a strong constitution and well developed lungs, and well nourished bodies, are not susceptible to consumption, and the bacilli, if they enter the lungs of such persons, speedily perish. If it were not for this fact, that the majority are proof against the disease, we should probably most of us die of consumption, for the tubercle bacilli are present at all times in considerable quantity in cities, in the dust of the street, and in the air of buildings and rooms where many people congregate. If we could be sure that all of the sputum and the excreta from persons suffering from this disease were destroyed or disinfected, consumption could probably be almost entirely eradicated. For the purpose of popularizing this recently acquired knowledge of the nature of consumption, and urging proper care on the part of patients, the following circular was printed and distributed very generally throughout the city. By request of many physicians packages of the circular were sent to each practitioner for distribution to those of their patients suffering with the disease, and to their friends. It is believed that better results will be obtained in this way than by requiring physicians to report cases of consumption to this office.

Unfortunately tuberculous disease is not confined to the human species, but afflicts many of the lower animals even more severely than it does man. Cattle are particularly subject to it, and the Secretary of the State Board of Health in

his report for 1888 says that probably a large proportion of the cows of this State are suffering from one form or another of tuberculous disease. The tubercle bacilli are often found in large numbers in the milk of such cows, and if taken into the alimentary canal of infants may there develop and cause consumption of the bowels, with, perhaps later, consumption of the lungs, or tubercular disease of the joints. To prevent all this the only remedy is a periodic inspection of the dairy farms supplying milk to the city, but as these farms are almost entirely in neighboring towns of the State they are beyond the jurisdiction of this department. The chemical examination of milk after it has reached the city will show whether it has been adulterated or not, but it will not detect the tubercle bacilli and the microscopical examination is so difficult that it is impracticable to apply it. Examination of the cows themselves by a skilled veterinarian is necessary, and the State Board of Health should have sufficient funds to undertake this, and ample power to destroy all cattle found to be diseased.

PREVENTION OF CONSUMPTION.

Consumption causes more deaths than any other disease the human race is subject to. Nevertheless it is to a very large extent preventable. It is, though not generally known, a contagious disease. Consumption, or pulmonary tuberculosis, is in every case caused by disease germs which grow in the lungs in enormous numbers. When a person is sick with this disease these germs are coughed up in great quantities in the expectoration, and when this becomes dry and crumbles, or is trodden to dust, the germs float about in the air and are liable to be breathed into the lungs of any one. If the lungs of the person who does breathe them in are poorly developed, or if the constitution is feeble, the germs are very sure to grow and cause the disease. Unfortunately we do not know how to kill them when they are once in the air passages. The best that can be done is to build up the system and strengthen the lungs by good food and fresh air.

Much, however, can be done to prevent the spread of the disease by destroying the germs as completely as possible in every case.

I.

No person with consumption should ever spit on the floor or in the street. If handkerchiefs or bits of cloth are employed they should be at once disinfected, or burned. A good plan is to use a small wide-mouthed bottle with a rubber stopper. The contents should be thrown into the fire and the bottle thoroughly scalded with *boiling* hot water every day.

II.

The dishes used by a consumptive should be at once scalded, and the soiled underwear and bed clothing should not be thrown with that of other persons, but should be thoroughly boiled as soon as possible.

III.

When a person with consumption has diarrhoea, the discharges from the bowels should at once be disinfected, as at this time they contain the disease germs.

A good way is to add a half teacupful of fresh chloride of lime, or fill up the chamber vessel with *boiling* water.

IV.

No one with consumption should sleep in the same room with another person, and the room occupied by a consumptive should be thoroughly cleansed as often as possible.

V.

No mother with consumption should nurse an infant, and children ought never to be taken care of by a consumptive person.

CONTAGIOUS DISEASES.

During the year 1888 there was very little measles in Providence, but during the latter part of 1889 it again began to prevail. Fourteen deaths are attributed to that cause. Measles appears in epidemics, but at not very regular intervals. The following table shows the number of deaths from measles each year since 1856, and indicates that the disease is by no means so harmless as it is popularly supposed to be. This department has as yet been unable to devise any feasible means for checking its spread. It is so often unrecognized in its incipient stage, when it is most contagious, and is so little feared by our citizens, that it does not seem possible, at present, to wage a very successful warfare against it. About all that can be done is to cultivate a wholesome dread of it.

1856.....	1	1865.....	7	1874.....	4	1883.....	8
1857.....	2	1866.....	9	1875.....	0	1884.....	7
1858.....	40	1867.....	0	1876.....	0	1885.....	8
1859.....	0	1868.....	4	1877.....	2	1886.....	7
1860.....	0	1869.....	6	1878.....	50	1887.....	90
1861.....	6	1870.....	16	1879.....	0	1888.....	2
1862.....	1	1871.....	1	1880.....	3	1889.....	14
1863.....	16	1872.....	7	1881.....	25		—
1864.....	7	1873.....	28	1882.....	4	34 years.....	377

Whooping cough is another disease which is too lightly looked upon. It prevailed quite extensively in 1889, and 44 deaths were attributed to it. In this disease, as in measles, doubtless more than the number of deaths reported should be laid to its charge, for in both diseases the lungs are so weakened as to give rise to subsequent fatal pulmonary complications.

The following table shows the number of deaths from whooping cough each year since 1856:

1856.....	10	1868.....	13	1880.....	11
1857.....	2	1869.....	16	1881.....	40
1858.....	7	1870.....	24	1882.....	40
1859.....	22	1871.....	10	1883.....	4
1860.....	19	1872.....	10	1884.....	28
1861.....	25	1873.....	18	1885.....	24
1862.....	3	1874.....	33	1886.....	23
1863.....	6	1875.....	8	1887.....	12
1864.....	10	1876.....	35	1888.....	28
1865.....	31	1877.....	16	1889.....	44
1866.....	8	1878.....	43	—	—
1867.....	2	1879.....	15	34 years...	640

There was no case of small-pox in the city in 1889. The only cases since 1875 were one fatal case in 1883 and one mild case, which recovered, in 1887. The principal contagious diseases which prevail in Providence, and of which reports are required from physicians, are scarlet fever, typhoid fever and diphtheria. The following tables show the prevalence of each during the past six years. It will be seen that there were, in all, 658 cases of these diseases in 1889. All but 25 of these were reported by the attending physicians. This shows a failure on the part of the medical attendant in complying with the law in less than 4 per cent. of all cases. In most of these it was forgetfulness on the part of the physician, rather than wilful neglect. Indeed, I believe there is only one physician now in the city who deliberately intends to disregard the law whenever he deems it safe to do so. In some cases, also, failure to report is the result of failure to recognize the disease, or the existence of a reasonable doubt as to its nature; though in the latter case the attending physician should call in the health officer to bear his share of the burden of that doubt. The teachers in the public schools all report to this office cases of contagious disease coming to their notice; and in making his visits of inspection the medical inspector always inquires about the existence of the disease in the neighborhood. Rarely, in following up reports so obtained, does he come upon true cases of the disease in question; in most instances he finds the rumor ill-founded. In these various ways it is believed that very few cases of contagious disease escape the notice of this department. I have no doubt that when this does occur it is due almost always to a failure to recognize the disease, either because it is a mild case and no physician is called in, or because the medical attendant himself is led astray in his diagnosis. This is borne out by the fact that there was failure to report scarlet fever, which is usually easy to recognize, in only four instances; in typhoid fever, which is more doubtful, in six; while diphtheria, about which it is much more difficult to come to a conclusion than in either of the others, there were fifteen failures to report. I do not mean to claim that this department is infallible in diagnosis, or that the medical attendant can be expected to determine the disease in all cases. I fully appreciate his difficulties; and if this department has been able

in doubtful cases to determine the nature of the disease only after it has run its course, and perhaps other and typical cases have developed from it, I certainly can attach no blame to another for failure to recognize it earlier.

SCARLET FEVER.

YEAR.	Cases.	Deaths.	Rate of Mortality.
1884.....	538	57	10.59
1885.....	383	38	9.52
1886.....	237	30	12.65
1887.....	848	153	18.04
1888.....	361	80	22.16
1889.....	162	25	15.43

TYPHOID FEVER.

YEAR.	Cases.	Deaths.	Rate of Mortality.
1884.....	122	52	42.62
1885.....	87	44	50.57
1886.....	104	53	50.96
1887.....	66	39	59.09
1888.....	403	103	25.55
1889.....	198	59	29.76

DIPHTHERIA.

YEAR.	Cases.	Deaths.	Rate of Mortality.
1884.....	193	58	30.05
1885.....	146	37	25.34
1886.....	322	98	30.43
1887.....	307	109	35.50
1888.....	230	98	42.61
1889.....	303	97	32.01

Scarlet fever, when left to itself, tends to recur in epidemics about every five years. But if active measures are taken for its suppression, this regularity may be considerably interfered with. This is well illustrated by the history of the disease in many cities, notably Boston, where the energetic action of the health department has resulted not only in markedly diminishing the death rate from this disease, but has interrupted the marked periodicity in it which formerly occurred. A severe epidemic began in Providence in the autumn of 1887, but it was speedily checked, owing to the interest which was taken in the epidemic by the great body of our citizens, and the care which they consequently exercised. Since that time there has been only a very moderate amount of scarlet fever in the city; particularly since June, 1889. During the last half of the year only 45 cases were reported, with five deaths, and four of these were in July. The mildness of the disease is particularly remarkable; and this, together with the greatly lessened tendency to spread, has led me to mistrust that some of the reported cases were not scarlatina. This mistrust is strengthened by the fact that I have several times, during the past few months, been called in consultation by physicians to see suspected cases, which shows that similar doubts have existed in the minds of others. During the past year, scarlet fever has several times been imported into the city; and these cases and those which sprang from them, have been the most severe which have occurred. A record of some of these cases may be of interest and value.

A family from Ireland moved to S—— street in the latter part of September. Five days after leaving the vessel two of the children were taken sick with scarlet fever. Other members of the family had had scarlet fever a few months before. There was no scarlet fever at this time among their neighbors or friends.

On September 20-22, the children of Mrs. G——, on S—— avenue, visited friends in an adjoining town. A child in this family had had what, from a description of the case, was scarlet fever, about two weeks before the visit. On their return from this visit, the G—— children were taken sick with scarlet fever: one on the 28th of September, and the others about a week later. There was then no scarlet fever in that part of Providence.

In May, 1889, Mrs. —— moved to 38 B—— street. Her child had died two years before, of scarlet fever. The clothes of this child were placed in the attic, and the children of another family in the house—the X's—played among them and were taken sick with scarlet fever in July. The house was only imperfectly disinfected by the family. On September 21st, a family just from England moved into this tenement and stayed five days, moved out, and came back to the lower tenement October 1st. Scarlet fever developed October 11th. The disease spread to several families in the immediate neighborhood.

In October, a boy came from Connecticut to visit some friends on E—— street. He had had scarlet fever two weeks before and was desquamating at the time of his visit. Within a few days of his arrival, scarlet fever appeared in the family where he was visiting.

Two years ago, I began the collection of data in regard to scarlet fever; in each case of the disease waiting for sufficient time to elapse for all in the family to have the disease who would be liable to have it. At least two months is al-

lowed to elapse. I have continued this plan ever since, and the following table presents the results of the three years' work :

	1887.	1888.	1889.	Total.
Number of families in which there was more than one susceptible child.....	232	244	73	534
Number of these in which there was no second case.....	102	97	43	130
Number of susceptible children in all the above families.....	986	827	242	2,010
Number of these children who were attacked.....	452	511	126	1,070
Number of additional families with susceptible children in the same house where the disease appeared	112	128	18	251
Number of susceptible children in these families....	381	354	34	757
Number of these additional families attacked.....	27	16	0	43
Number of children in these families attacked.....	58	21	0	79
Number of families where inoculation was practiced.....	87	99	36	217
Number of instances in the above families where the disease spread beyond the first case....	44	64	12	119
Number of susceptible children in these families.....	218	496	191	832
Number of these children who were attacked.....	148	319	56	515
Number of tenements which were fumigated.....	51	63	35	144
Number of instances where fumigation was done, and where the disease spread to other families in the house.....	5	5	0	10
Number of instances where susceptible children were at once removed....	24	18	10	52
Number of instances where they were attacked on their return.	3	1	0	4

It will be seen that the figures indicate about the same results for each of the years, except that in 1889 the disease shows less of a tendency to spread. This may be due partly to increased precaution and better methods of disinfection, but is rather, I believe, to be attributed to a milder form of the disease and to the errors of diagnosis, before referred to.

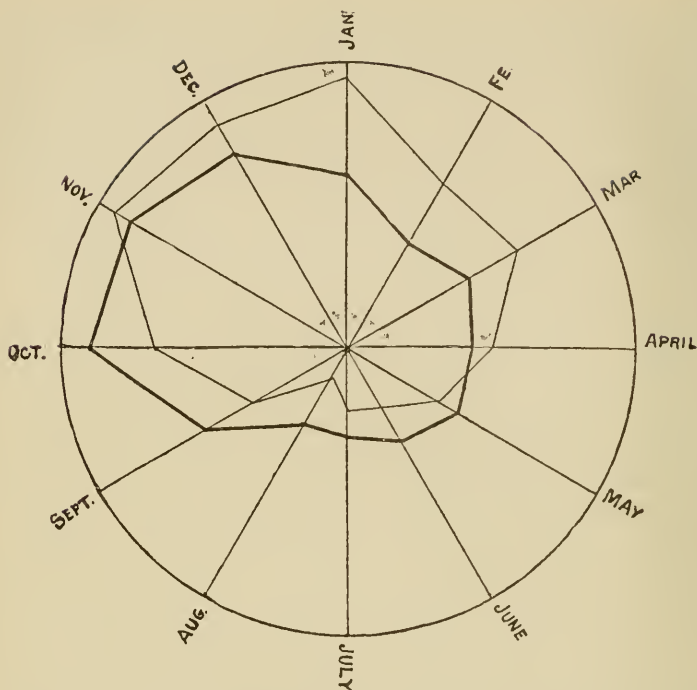
The following tables show the ages of 1,009 persons attacked by scarlet fever, the proportion of those exposed of each age who were attacked, and the proportion of those attacked at each age to the total population of the same age. The figures cover the past three years :

Ages.	Cases.	Number Exposed.	Percentage of those exposed who were attacked.	No. per thousand of population of each age attacked.
Under 1 year.	28	116	24.1	10.9
1	36	86	41.8	23.5
2	100	177	56.5	35.1
3	99	177	55.9	39.8
4	104	173	60.1	41.6
5	82	183	44.8	32.9
6	101	164	61.6	40.6
7	93	151	61.6	36.8
8	68	143	47.5	28.4
9	61	151	46.5	25.8
10	41	90	45.6	16.2
11	41	96	42.7	17.8
12	29	89	32.6	12.
13	24	73	32.8	11.2
14	19	65	29.2	8.4
15	14	61	22.9	6.2
16	11	36	30.6	4.5
17	7	31	22.5	2.9
18	1	2	50.	.4
19	5	15	33.3	2.
20	6	14	42.8	2.3
Adults.	39	56	69.6	4.9

There were 198 cases of typhoid fever in 1889, with 59 deaths. In 1888 there were 403 cases and 103 deaths. The exceptionally large number in 1888 was due to the epidemic, the cause of which was considered in my last report. A considerable number of the cases in 1889 were as usual evidently contracted outside of the city. The accompanying table shows the number of cases occurring in the city and State since 1856.

During the past four years diphtheria has prevailed more extensively in Providence than it did for the four years preceding that time, but at no time since 1878 has the mortality nearly equaled that of the severe epidemic of that and the year immediately preceding. What causes this moderate increase of the disease we do not know. It is not confined to Providence, but is the same in the principal cities of New England and the Middle States. Diphtheria exhibits a tendency, which we do not as yet understand, to appear and disappear, and to vary greatly in extent and severity at different times. During the early part of this century it was entirely absent from this country, and first appeared in New York in 1856. Two years later the first cases occurred in Providence. The accompanying chart shows the percentage of deaths from known causes due to diphtheria during the last forty-nine years. This chart was prepared to show the relationship of diphtheria, if any exists, to certain other diseases. It has been claimed by some that diphtheria, instead of being an imported disease in 1856, was always with us, and its apparent increase in recent years is simply due to calling old things by a new name. It is also believed by many that croup and diphtheria are identical. In this chart one line represents diphtheria, and another croup. If diphtheria and croup are identical and have long prevailed, their lines might, it is true, appear as they do on the chart. But as the term croup is, and always has been, except in rare instances, confined to a disease existing almost entirely in the larynx, while in diphtheria there is in many, in fact in a majority of cases, no symptoms referable to the larynx, we should expect that the number of cases of croup would diminish as diphtheria attained a greater and greater prominence in medical nomenclature, while as a matter of fact both increase together. Still, from all that the chart indicates, diphtheria and croup might be identical, for there might have been some climatic or other causes operating in 1856 which very greatly increased the number of cases of croup, both of the laryngeal and the much rarer pharyngeal forms. But if we should study the history of the disease, which it is here not the proper place to do, we should find that the remarkable increase in croup, if increase it was, thirty or thirty-five years ago, was a progressive one, and spread over the continent of Europe to England and then to the United States. We can hardly conceive that this progressive increase could be due to anything but the advent of a new and distinct disease.

Another reason for believing that diphtheria and croup are distinct diseases, are the different seasons at which they occur. The following diagram exhibits the seasonal occurrence of the two diseases, and it will be seen that their lines are not by any means identical :



I do not here refer to the clinical points of difference, but only present reasons which are made evident to a health officer. The clinical differences, while clear enough in many instances, are not so in others, and it would undoubtedly be safer if all cases of membranous croup were considered contagious. But truth is always better than falsehood, and while we take proper precaution in all cases, we should, I think, recognize the difference between the two diseases, which I believe to exist. If diphtheria has always existed here it must have been called by some other name, and the bottom line in the chart includes (with the exception of scarlet fever) all diseases which it seems possible could have been confounded with diphtheria. These are laryngitis, quinsy, thrush, and tonsillitis, and of these tonsillitis and laryngitis caused less deaths before 1856 than they have since. It will be seen from the chart that all these causes combined caused so few deaths that, they never could have included the unrecognized cases of diphtheria if it prevailed to any appreciable extent before 1856. Thinking that perhaps diphtheria might have been called a *scarlatina anginosa*, with slight *exanthem*, I have added a line for scarlet fever, but it will be seen that it is neither supplementary nor parallel to diphtheria.

It would appear, then, that diphtheria is a specific disease, but it must be confessed that we do not at present know nearly as much about it as we would like to. In fact our knowledge of its nature is much less certain than it is about any of the other contagious diseases. Unfortunately, also, its diagnosis is by no

means easy, and it is very difficult often to distinguish between a catarrhal pharyngitis, a follicular tonsillitis, and true diphtheria. The disease varies greatly in virulence and in contagiousness, and I have sometimes thought that possibly in certain persons the poison might lose its virulence or die out. If we could only isolate the specific poison of diphtheria, as has been done in typhoid fever and cholera, all doubtful points would be cleared up, and it is to the bacteriologist and the chemist that we must look for this solution. Various able investigators have, it is true, claimed to have isolated the specific organism of this disease, but their claims have not, as yet, received sufficient corroborative evidence to warrant their general acceptance. Meanwhile, we must try to extend our knowledge as much as possible by the slow method of the study of cases. For this purpose I have tabulated the data obtained during the year in regard to diphtheria in much the same way as scarlet fever was treated. The table is for 1889:

Number of families in which there was more than one child.....	121
Number of these in which there was more than one case.....	47
Number of children in all the above families.....	472
Number of these children who were attacked.....	231
Number of additional families with children in the same house.....	38
Number of children in these families.....	95
Number of these additional families attacked.....	7
Number of children in these families attacked.....	11
Number of tenements which were fumigated.....	57
Number of instances where fumigation was done, and where the disease spread to other families in the house.....	1
Number of children who were at once removed.....	26
Number of instances where they were attacked on their return.....	0

This table indicates that diphtheria is a disease of about the same degree of contagiousness as is scarlet fever. About one-half of those under fifteen years of age who are exposed directly to it are attacked, and it exhibits about the same tendency as scarlet fever to extend to other families in the same house. The need of precautionary measures during convalescence is not necessary for so long a time as in scarlet fever.

Investigation showed apparently that no immunity against diphtheria is secured by one attack, for of fifty-one persons who had previously had it, and who were exposed to the disease, twenty-five acquired it a second time. Of the instances where there were a number of cases in the same family, in only one was the first case mild and followed by severe or fatal ones. In all the others the first case was the worst. From the above table it will be seen that of twenty-six children who were removed from the house promptly on the advent of the disease, not a single one was attacked on its return. The time in which they were away was from one to three weeks, being on the average two weeks.

The following table shows the ages of the persons attacked by diphtheria :

Ages.	Cases.	Number Exposed.	Percentage of those exposed who were attacked.	No. per thousand of population of each age attacked.
Under 1 year.	3	20	13.0	1.1
1 "	13	10	56.5	8.5
2 "	23	9	71.9	8.1
3 "	18	18	50.0	7.2
4 "	23	9	71.9	9.2
5 "	27	10	72.9	10.8
6 "	23	16	60.5	9.2
7 "	17	18	48.6	6.7
8 "	14	11	56.0	5.8
9 "	10	15	40.0	4.2
10 "	13	9	59.0	5.1
11 "	11	8	57.9	4.8
12 "	15	13	53.5	6.2
13 "	4	5	44.4	2.0
14 "	3	10	23.0	1.3
15 "	4	5	44.4	1.8
16 "	2	4	33.3	.8
17 "	2	6	25.0	.8
18 "	3	3	50.0	1.1
19 "	2	3	40.0	.8
20 "	2	2	50.0	.8
Adults.....	36	231	13.5	4.6

This table does not deal with a large enough number of cases to warrant any very general deductions, but it seems to show that diphtheria is not confined to one age as closely as is scarlet fever, though it shows a predilection for the ages from two to twelve. The apparent small number of individuals between the ages of sixteen and twenty-one is due to the fact that many persons between these ages are called by their friends "grown up," and the inspector has made no effort to distinguish between the ages of the adults.

During the latter part of the summer there was a case of diphtheria in Tallman's lane which was not reported by the attending physician. No precautions were taken by the family or their neighbors, as there doubtless would have been had the house been placarded. A child in the next house—the open windows being separated by only a few feet—was attacked in a few days, and within two weeks seven other families within a radius of three hundred feet, had children suffering with this disease. The children of these families played freely with one another in the yards and streets, and in some cases visited each others' houses. The father of one of the sick children visited very frequently relatives on P—— street, and soon after the disease appeared in his own family, it appeared in P—— street also. Thence it was directly traced to two families in the immediate neighborhood. In all there were fourteen cases and eight deaths. Of course, with the freedom of communication which exists in cities, and the countless and unknown sources of contagion, it cannot be definitely proved that the above unhappy course of events was directly induced by the unreported case in Tallman's lane, but the circumstantial evidence is very strong, and it is a striking illustration of the dangers of hidden cases of contagious disease.

Another case of diphtheria which is of interest, occurred at the St. Aloysius Orphan Asylum, May 20. A boy who had come to the institution May 17, was taken sick with the disease. He, with an attendant, was at once isolated as completely as possible. A sheet wet in bichloride solution was hung before the door, the unused beds were covered with sheets, and nothing was afterwards removed from the room. June 8th two other cases occurred which were also isolated in the same ward. One case died, and on the recovery of the other the room was disinfected by washing the floor and woodwork with bichloride, and washing all the bed-clothing and body clothing in the same solution, and then boiling it. The mattresses on which the sick children lay were burned. The rooms were thoroughly aired for two months and white-washed before being again occupied. No other cases occurred. There was no sulphur fumigation. As there were nearly three hundred young children in the institution this is a good illustration of the efficacy of strict isolation and thorough cleansing.

DISINFECTION.

The satisfactory disinfection of private houses, after contagious diseases, is a very difficult matter. In the present state of medical science we are not by any means certain what will destroy the specific poison of these diseases; or at least, those of them in which there is the most need of disinfection in our American cities. I refer particularly to scarlet fever and diphtheria. It is a common thing for medical men and others to consider that these two diseases are "germ diseases;" and it is, indeed, very probable that they are. Yet we do not know this positively; and until the specific poison of the disease, whether it be a germ or something else, has been isolated and studied, our knowledge can never be exact. If it is found true that scarlet fever, diphtheria and small-pox are caused by micro-organisms similar in nature to those which cause certain other contagious diseases, then we should be sure that a very popular method of disinfection is entirely useless as ordinarily practiced. I refer to fumigation with burning sulphur. When sulphur is burned in an ordinary room, in the proportion

of two or three pounds to each 1,000 cubic feet of air space, the specific organism of typhoid fever and anthrax, and the pus-forming microbes are destroyed only to a slight extent, and only when exposed in such a way as to be readily reached by the concentrated fumes. I have tried the experiment, many times, of exposing rags saturated with cultures of these organisms in rooms which we were fumigating with sulphur in the ordinary way, but have rarely succeeded in thus rendering them sterile. Such experiments have been performed by so many competent observers that there is no question as to the failure of sulphur to accomplish a disinfection in such cases. But it is hardly permissible to argue from this that sulphur fumigation is equally valueless in all other diseases. It is very possible that the poison of scarlet fever, diphtheria and small-pox may be of an altogether different nature, even if these too are germ diseases.

In fact, there is considerable evidence to be obtained from the statistics of fumigation to show that sulphur fumigation is of value in destroying the poison. The following facts have been obtained in this city: Where fumigation was done by this department, in cases of scarlet fever, the disease extended to other families in the same house in about 9 per cent. of the cases; where fumigation was not done, it extended in 25 per cent. of the cases. This was in 1887 and 1888. Too much importance should not, however, be attached to these figures, for it must be remembered that where fumigation was done best, there, also, other precautions would be best carried out.

In 1889, fumigation with the addition of steam disinfection, in nearly every instance, was done in 35 cases of scarlet fever where there were other families with susceptible children in the same house, and in no case was there extension of the disease. In 57 cases of diphtheria, where fumigation and disinfection by steam was done, there was extension in not a single case; while in the cases where it was not done, it spread in over 19 per cent. of the cases. We know from actual experiment that sulphur di-oxide is capable of destroying the virus of vaccinia, a disease closely allied to the other exanthemata. Therefore, in the absence of direct evidence to the contrary, I hardly feel like giving up sulphur fumigation, although it is accompanied by considerable inconvenience to the family.

What we should aim at, in all these cases of contagious disease, is first, to secure as slight an infection of the house and its contents as possible. Hence a circular of caution is always left when the medical inspector makes a visit. This circular also gives directions as to what the family should do in the way of disinfecting all clothing which can be washed, and the wood-work, walls, etc., of the rooms.

HEALTH DEPARTMENT.

Directions for the Management of Scarlet Fever and Diphtheria.

The law makes both the physician and the head of the household responsible for reporting contagious and infectious disease. Scarlet fever and diphtheria are such diseases, and whenever a case occurs in any family, it is the duty of the head of the family at once to report such case to the Superintendent of Health, or else to see that the attending physician does so. This rule applies not only to the first case in the house, but to all that may follow.

Scarlet fever and diphtheria are caused by direct intercourse with one who has these diseases, or they may be caused by the poison which is carried from the sick to the well in clothing, books, toys, and other articles. Cats and dogs, also, may carry the contagion in their fur or hair. In diphtheria, however, it is possible that the poison which causes the disease may find its way into drains, waste-pipes, cesspools, and similar places, and may there develop so that the sewer gas which escapes from them may give rise to fresh cases.

As soon as any one is taken sick with either of these diseases, a room should at once be selected and the patient put in it and not removed until all danger of contagion shall have passed. A room on the upper floor of the house and away from all children, is of course preferable.

A building with all modern improvements has recently been constructed at the Rhode Island Hospital expressly for the treatment of these diseases. It is earnestly recommended that in all cases in which it is impossible to secure isolation at home, that the patient be removed to the hospital.

All articles not needful should be removed from the room before the patient is carried in. Curtains, blankets, and clothing of every kind are especially liable to retain and carry the poison, and all such, if not required for the comfort of the patient, should be taken from the room. It is better to have the floor bare, with the exception of a few strips of carpet, as these can be more easily disinfected than a whole carpet. Birds and plants should be removed.

No person except the physician, nurse or mother, should be allowed to enter the room, and nothing should be taken from it until it has been thoroughly disinfected.

All members of the household should be kept away from public places as much as possible, and no child should be allowed to attend day school, Sunday School, church, or similar place, or to ride in the horse cars or any public conveyance, or to play in the street or yard with other children, until all danger of carrying the contagion shall have passed.

No visitors, especially children, should be allowed in the house.

The rules of the Board of Aldermen require that a card be placed upon the house stating that there is scarlet fever or diphtheria within.

All discharges from the patient are dangerous, and should be received in vessels containing at least a quart of the disinfecting solution.

The water closet or vault into which the discharges are emptied, as well as any set basin or sink in the house, should be disinfected daily.

Soiled linen, sheets, underwear, towels and similar articles, should be at once placed in a tub or pail standing in the room and containing a disinfecting solution, and they should afterwards be thoroughly boiled and washed apart from the rest of the washing. It is best not to use handkerchiefs at all, but pieces of old soft cloth, which should at once be burned.

All dishes used by the patient should be put into a disinfecting solution in the room and scalded and washed by themselves.

Until desquamation or peeling of the skin shall have ceased, in cases of scarlet fever, the patient should be thoroughly annointed from head to foot with

sweet oil, or some similar substance, at least once each day. Ointment for this purpose will be furnished by the Health Department without charge to those unable to pay.

The time during which these precautions should be taken is, in scarlet fever, until five weeks from the beginning of the last case in the house, and until the sick room and its contents have been thoroughly disinfected; in diphtheria, until one week after the recovery of the last case and until the room and its contents have been disinfected. When this time has elapsed, the patient should have a bath and change of clothing, and then the room and its contents should be thoroughly disinfected.

Children must obtain a written permit from the Health Department before they return to school.

If the patient should die, the body should be immediately washed in a disinfecting solution and placed in the casket, which should be tightly sealed and not opened again. The whole house should then be disinfected before a funeral is allowed, and the law requires that the funeral must, in such cases, be private.

A good disinfectant is made by dissolving four ounces of corrosive sublimate in a gallon of water. It may then be kept in a glass bottle. It must be used carefully, as it is very poisonous. It must not come in contact with any metal receptacle, but be used only in wood, earthenware or glass. For ordinary use, such as soaking clothing, washing the hands or wood-work of the room, or disinfecting the drain-pipes, it should be diluted by adding one-half pint of the above to a pailful of water.

Cloths dipped in carbolic acid, or carbolic acid placed in a saucer, or chloride of lime, or similar substances kept about the sick room, are of very little use, and should not be relied upon.

The following is the best method of disinfecting a room and its contents after the disease is over: All clothing and bedding which can be washed should be soaked for several hours in the disinfecting solution and then boiled. Clothing which cannot be washed, carpets, mattresses, etc., should be tied up in sheets wrung out in the disinfecting solution, and removed to the city disinfecting room, where they may be subjected to steam heat. The Health Department will do this without charge, when notified. Valueless articles of furniture and clothing should be burned. Polished furniture, picture frames, and articles of brass or bronze should be thoroughly rubbed off with dry cloths, which should be immediately burned, or washed in the disinfecting solution. Floors and woodwork, and walls and ceilings, if painted or white-washed, should be washed with the disinfecting solution. If the walls are papered the paper should be washed and removed, or if too valuable for that they may be rubbed down with lumps of bread which are allowed to fall on the floor which has been well wetted with the disinfecting solution.

Lastly, the room must be thoroughly aired for twenty-four hours or longer.

All these precautions should be taken in mild cases as well as in the more severe, for mild cases spread the disease as readily as do the latter.

When the time for fumigation has arrived, men detailed for that purpose remove bedding, carpets, hangings, and such other textile material as is most likely to retain the poison, and which cannot be washed. Sulphur is then burned in the infected apartments, and the goods spoken of are carried away to be disinfected by steam. At present, our arrangements for this purpose are very defective. The goods are placed in a movable wagon body covered with canvas; but as this body is made of wood, it is not at all durable, and a new one should be built of metal. It should also be built and mounted in such a way as to make it suitable for an ambulance to transport cases of contagious disease. Our disinfecting room is simply a frame building 8 feet by 13 feet, and 8 feet high. It is covered with pine feather-boardings and ceiled with matched spruce. It receives a two-inch pipe from a 35 horse-power upright tubular boiler, which also serves to furnish power for the stone-crusher in the city yard. The wagon body with its contents is rolled into the building, the doors closed and steam turned on. When I first used it, I found that the steam coming directly into the cold room and on to the cold goods, condensed so as to wet them badly; moreover, I could not, of course, get with the open steam a temperature of over 212° F., and the draught on the boiler was enormous. By putting in coils of pipe on the sides of the room, and heating it to 140°—150° F., before the live steam was turned on, the temperature could be immediately raised above the boiling point and would speedily reach 250° F. and over. This heat has so warped the building that it leaks to such an extent as to render the expense from the loss of steam a considerable item. Moreover, the boiler cannot furnish enough steam except at the noon hour. We should have an iron chamber which would hold a pressure of 25 pounds or more. It would speedily pay for itself in the saving of steam. It would undoubtedly be economy to super-heat the steam, but this, at present, cannot be well arranged. If this steam apparatus were put in proper condition it would also greatly expedite our work. Besides disinfecting with steam and sulphur, I think that it would be a good plan, at least among the poor where probably alone it would be necessary or desired, for the city to send a couple of scrub-women who should thoroughly understand how to clean the house with disinfectants. I tried taking a portable boiler to a house and disinfecting a room with live steam carried through an inch rubber hose put through a board under the window. The temperature of the room was raised to nearly 212° F., and kept there fifteen minutes, but as was to be expected, the results were disastrous to the room. It was, doubtless, disinfected, but the paper dropped off, the furniture fell to pieces, and the paint was blistered.

During the past year, 35 premises were disinfected with sulphur only, and the steam apparatus was brought into use 79 times, and in most of these cases sulphur was used besides. The best way to stamp out a contagious disease is to remove every case of it to the hospital. The Rhode Island Hospital has recently constructed a commodious ward for the treatment of these diseases, and they offer to treat all cases which may be sent there by the Health Department, on reasonable terms. As this would do away with any necessity for the city putting up such a building, I recommend that the offer be accepted.

VACCINATION.

During the year 1889, the number of persons vaccinated was 1,136 ; making the total number of persons vaccinated by the Health Department, since 1856, 51,271. The only public vaccination has been at the City Hall, on Saturday afternoons. Humanized virus only is employed. The number of transfers in 1889 was 50 ; making the total number of transfers since 1868, when an accurate record was begun, 349. The number of certificates of vaccination issued was 1,344 ; which makes the total number issued since 1856, 46,745.

SWILL.

Messrs. A. E. Field & Son continued to collect and dispose of the swill, under their old contract, at \$14,500 per annum, until April 1, 1889. At that time their contract expired and they demanded \$24,000. Thinking that in case there were no other bidders it might be necessary for the city to undertake the work, I began to look about for some better method of disposal than feeding it to swine and cattle, the method adopted by the Messrs. Field. I was considering the project of separating the grease by means of naphtha, when I accidentally heard that this very process was in active operation in Buffalo. I immediately entered into correspondence with the parties owning this process, and by their courtesy was enabled to examine their works in that city. I was very much pleased with their method of disposal, and induced them to put in a bid for collecting and disposing of our swill, but their bid proved too high. Meanwhile, the Fields had consented to take the swill a month longer. When the bids were opened, it was found that A. H. & J. Barney were the lowest bidders : they agreeing to collect and remove the swill for 15½ cents per head of the population per annum. Their bid was accepted, and they would have taken hold of the work on May 1st, if they had not been disappointed in securing a certain means of disposal for it, which they were promised and had counted upon. The contractors then made arrangements with the Fields to dispose of the swill in the old way until something else could be devised. Since then, a company has been formed to receive the swill, dry it, and remove the grease by means of naphtha. Works have been constructed on the cove lands and are now in partial operation. Two processes are being tested to determine their relative merits : In one, the swill is put through a drying machine and the moisture removed and passed through fire. After passing through the dryer, the material is treated with naphtha, to remove the grease, and the residue has some value as a fertilizer. In the other process, the swill, after having the superfluous water pressed out by a powerful press, is put at once into air-tight tanks where it is dried and the grease extracted at the same time. In neither case does any nuisance arise from the process, the only odor about the premises being due to the discharge of the swill from the carts in which it is collected. This process is certainly far superior, from a sanitary standpoint, to feeding it to animals and producing inferior beef and pork, and milk which is not fit to drink.

During the year, the number of complaints made at this office in regard to the collection of swill was 231, as compared with 299 in 1888, and 329 in 1887.

The number of special permits granted in 1889, to remove swill from hotels and restaurants, was 15. In 1888 it was 17. Men have been stationed on the

dumps at Acorn street, Allen's avenue and Long Pond, all through the year, to cover up all offensive material dumped there.

NIGHT-SOIL.

The number of licenses granted to scavengers in 1889 was 119. The year before it was 117. The collection and disposal of night-soil is a serious problem scarcely second in importance to that of garbage disposal. At present the scavengers are totally unreliable and are provided with inadequate and defective apparatus, and do their work in a slovenly manner. Complaint is constantly made in regard to them, and the frequent passage of their wagons along such streets as Greenwich, Broad and Cranston, causes an almost insufferable nuisance. The best way to remedy these evils is for the city to take this work in hand. Proper apparatus should be purchased and operated by the city, and a charge made for each vault cleaned. In the case of vaults not on the line of sewered streets this charge should be nominal, while in the case of vaults and cesspools on sewered streets it should be excessive. If no other way of accomplishing this could be devised, it might very well be done by licensing all vaults and cesspools and charging a license fee. The material when collected should be transported out of the city by car or boat, and used by farmers for fertilizing. There are several extensive land owners who stand ready to take it. It is possible, also, that it might be dried in some suitable place in the city, so as to allow of cheaper handling. As I have repeatedly urged, this work can best be done by the city, but in default of this it would be a great improvement over the present plan if a license were granted to only one responsible scavenger, the city of course regulating the price, and exercising some check on the number of loads removed.

NUISANCES.

During most of the year only one inspector was employed, but during the summer season a second was engaged for a short time. The salary of the sanitary inspector is only \$900, which is extremely small in consideration of the amount of work he has to do, and the efficient service he has rendered. I know of no city in the country where a single inspector is required to go over so much ground as he is here, and I know of no city which, with the exception of the unnumbered privy-vaults, is so free from nuisances as this.

New Haven, with a population of 85,000, has two inspectors, Boston and New York have one to every 20,000 or 30,000 inhabitants, and most other cities in proportion. While the work is greater the salary is less than is paid in most places, and I particularly recommend to your board that it be increased.

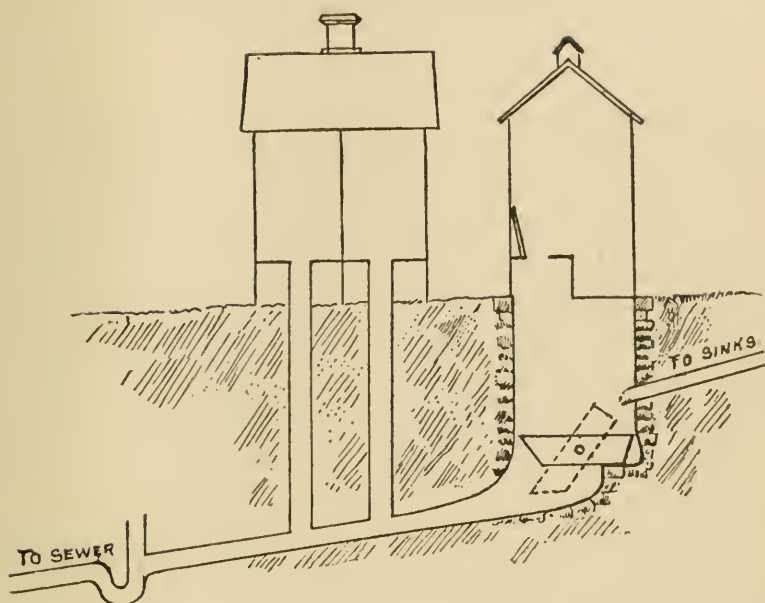
During the year 413 complaints were made at this office. Of them 316 were well-founded, while 97 were not. In addition to these complaints, 183 were received through the police, making 596 complaints received from the public during the year. Many of these, however, had already received attention when the formal report reached this office. The nuisances abated during the year were as follows :

Privy-vaults full and offensive	1,381
Cesspools full and offensive	219

Defective vaults and cesspools.....	99
Uncovered vaults and cesspools	71
Cesspools and vaults leaking on to adjoining estates.....	36
No vault to privy.....	2
No cesspool on estate.....	11
Cesspools and vaults leaking into cellar.....	58
Defective waste and drain pipes.....	323
No traps.....	167
Filthy yards.....	464
Filthy water flowing into the street.....	51
Defective water closets.....	19
Filthy cellars.....	70
Privy vaults removed.....	16
Tenements cleaned.....	6

When a nuisance exists on any premises in the city, a letter is at once sent to the owner to abate it, and if he does not do it within a reasonable time the case is reported to the Board of Aldermen for action. In 1888 the board issued 394 orders under form A, to abate nuisances, and 40 under form C, to vacate tenements. When the board is not in session, I have authority, under Chapter 495 of the Public Statutes, to issue such orders, and during the year 48 were issued from this office.

As usual the most complaints are about privy-vaults. They furnish more nuisances than all other causes together. A privy-vault in a city is, in ninety-nine cases out of a hundred, a nuisance. When it is on the line of a sewered street it should *never* be tolerated. Ever since I have been Superintendent of Health I have labored to have them removed, but have always been handicapped by the absence of any decisive law on that subject. . . . I trust that during the coming summer the board will order the removal of all vaults on sewered streets which may be brought to their notice. Even at the best it will be impossible to reach some of the worst cases, for the law is so framed that non-resident land owners can practically do as they please. It would be difficult in some of the poorer tenements, which were not constructed for it, to put water closets in the house, and to meet these cases, I devised two years ago a contrivance which is shown in the accompanying diagram :



It consists of a cast-iron tank set in a brick vault below the frost line. The tank is self-tilting, discharging its contents when it becomes full, when it swings directly into place again. It receives the sink water and the rain water from the roof of the house. It only holds a few gallons, and so even in a one family house flushes the drain quite often. In such a house the privy building can be set directly over the tank. In tenement houses with several families, it is better to build the privy over the drain, ten-inch earthenware pipes leading straight down from the seats to the drain. A trial has been made of both kinds in a place in this city where they would be well tested, and they have worked satisfactorily for two years. Any one is free to make use of this, and the castings can be obtained at the Builders' Iron Foundry. The idea for this was suggested by the valuable report of the health officer of Birmingham, England. What are called school-sinks are also useful for tenement houses and shallow vaults that are flushed out daily with a plentiful supply of clean water, and will effectually do away with the privy nuisance. One of these vaults has been in successful use in the tenements of the Nottingham Mills, and another has been put in at the Carpenter Street School.

I have repeatedly urged the need of a good plumbing law, and the appointment of a proper person to look after its enforcement, but as yet we are without one. Such a law should be carefully framed with special reference to the necessities of small house owners. It should not be too elaborate, as it is, I believe, in many cities, but should aim to present the most common faults which are to be found in our own community. It would be an excellent thing if such a law

could be enacted before the building operations of the summer season are commenced.

WATER SUPPLY.

Early in the year, in company with a representative of the Department of Public Works, I made a thorough examination of the Pawtuxet river. Many sources of pollution were found along the banks, and steps were at once taken by the Commissioner of Public Works to induce the riparian owners to put their property in such condition that there could be no possibility of dangerous pollution. An inspector was at once put on to see that the recommendations made by the commissioner were properly carried out. Unfortunately this was not done. The epidemic of typhoid fever last year showed that even an apparently insignificant amount of pollution is sufficient, if it be of a certain kind, to produce the most serious consequences. But it is very difficult to bring the dwellers or property owners along the banks of the river to realize that an almost infinitely small amount of human excrement as compared with the volume of water in the river could, and in fact has, caused hundreds of cases of sickness and scores of deaths in this city. It is probable that no one could be found who would willingly, for the sake of a few dollars, thus jeopardize the lives of his neighbors. Yet it is certain that a single evacuation from the bowels of a typhoid or cholera patient would be sufficient, if discharged into the Pawtuxet river, of causing an epidemic of the disease in Providence. It is this danger of pollution by human excrement which has been demonstrated to be competent to spread typhoid fever and cholera, and perhaps certain diarrhoeal diseases, which is to be particularly guarded against. If we could only keep out human fœces we should feel much relieved, even if barn-yard washings, sink water and manufacturing wastes continued to find their way in to a greater or less extent. Yet not many years ago the excrement of over two thousand persons was discharged daily into the stream, but owing to the efforts of the Commissioner of Public Works, this has almost, if not entirely, ceased. But experience has taught the lesson that privy-vaults along the river must be so built that there cannot, by any possibility of means, be a chance of their contents leaking, or being washed by rains into the water. But a privy-vault has to be unusually well built to permanently withstand the action of alkali which is formed by the decomposition within, and in large establishments employing many hands, or in tenement houses, constant vigilance is needed to secure the proper use of the sanitary arrangements that are provided, even if they are of the best.

The following analyses of the Pawtuxet water were made by Prof. John H. Appleton of Brown University. The figures signify parts (in weight) in one million parts of water (in weight).

1876—1889.

YEARS.	Total Residue.		Mineral Matter.		Organic and Volatile Matter.		Common Salt.		Albuminoid Ammonia.		Ammonia.	
	Aver- age.	Maxi- mum.	Aver- age.	Maxi- mum.	Aver- age.	Maxi- mum.	Aver- age.	Maxi- mum.	Aver- age.	Maxi- mum.	Aver- age.	Maxi- mum.
1876.....	50	62	30	44	20	30	5.72	8.50	.24	.40	.06	.11
1877.....	43	56	24	32	19	24	5.46	7.09	.23	.32	.06	.12
1878.....	37	54	21	34	16	24	5.47	8.51	.17	.25	.04	.10
1879.....	38	59	24	43	14	24	5.73	10.83	.17	.23	.05	.10
1880.....	45	70	29	49	16	22	6.35	8.76	.22	.26	.02	.14
1881.....	41	55	26	40	15	21	4.95	8.07	.21	.28	.02	.05
1882.....	43	59	27	42	16	25	4.43	6.60	.25	.38	.03	.08
1883.....	47	64	30	47	17	24	4.60	7.95	.27	.36	.04	.14
1884.....	45	72	29	43	16	29	4.79	7.33	.19	.32	.04	.14
1885.....	46	63	30	46	16	24	4.20	6.74	.22	.30	.05	.20?
1886.....	46	59	29	44	17	25	4.14	5.95	.22	.30	.05	.14
1887.....	42	63	24	40	17	25	4.15	6.84	.21	.36	.04	.10
1888.....	40	59	23	40	17	30	3.50	5.62	.19	.30	.05	.14
1889.....	58	52	22	29	17	27	2.86	4.99	.21	.30	.04	.10
Average...	42.9	.....	26.3	.....	16.6	.....	4.74	.....	.21	.....	.04	.....

ANALYSES FOR 1889.

Two analyses were made each month.

The figures signify parts (in weight) in one million parts of water (in weight).

MONTHS.	Total Residue.	Mineral Matter.	Organic and Volatile Matter.	Common Salt.	Albuminoid Ammonia.	Ammonia.
January.....	30 25	21 17	9 8	3.74 3.12	.10 .10	.01 .02
February.....	30 38	16 23	14 10	2.50 2.43	.20 .12	.02 .01
March.....	32 34	16 21	16 13	1.87 2.18	.14 16	.01 .02
April.....	32 27	20 16	12 11	1.56 2.50	.10 .16	.04 .04
May.....	34 42	17 25	17 17	2.81 3.43	.19 .22	.04 .06
June.....	40 40	18 25	22 15	2.50 3.74	.22 .22	.01 .04
July.....	47 40	24 19	23 21	1.87 3.12	.26 .24	.10 .10
August.....	48 51	22 29	26 22	1.87 2.50	.28 .28	.06 .00
September.....	43 52	21 25	22 27	2.81 2.18	.22 .30	.10 .06
October.....	45 44	28 25	17 19	3.74 2.81	.30 .26	.06 .04
November.....	45 43	29 27	16 16	3.43 4.99	.30 .26	.04 .00
December.....	32 33	20 19	12 14	3.12 2.81	.18 .12	.02 .02

1. SMITHFIELD.

2. Health Officer, Jenckes Smith.

3. There has been considerable prevalence of the following contagious or infectious diseases in town during 1889 :

Diphtheria, Georgiaville, 12 cases, 5 deaths ; May. Dysentery, Greenville, 5 deaths ; July and August. Measles, all about in the town ; no deaths known ; through the Winter.

4. No isolation maintained.

6. No inspection of premises made.

8. Do not know of any location that seems to be particularly unhealthy.

9. Would report to the town council nuisances dangerous to the public health if any were known.

10. Know of none.

SCITUATE.

No report from Health Officer.

WASHINGTON COUNTY.

1. CHARLESTOWN.

2. Health Officer, A. A. Saunders, M. D.

3. There were no epidemics in this town during 1889, except the Influenza or "La Grippe," around Carolina; 40 cases, no deaths; December 22d to 31st.

4. Isolation did not seem to be called for.

6. Some inspections have been made, advice given, requests made, and a better sanitary condition obtained.

7. No sanitary inspections made during 1889 by order of the town council.

8. No location in town that seems to be particularly unhealthy.

9. Should report to the town council nuisances dangerous to the public health.

10. No serious disease of domestic animals has largely prevailed.

EXETER. No report.

1. HOPKINTON.

2. Health Officer, Israel Gates.

3. No epidemics or any large prevalence of contagious or infectious diseases in town during 1889, except "La Grippe," everywhere; number of cases legion; no deaths to my knowledge; December.

4. No isolation attempted or called for.

7. There has been one case of fouling of a well by proximity of stable, which was examined and ordered abated as a nuisance.

8. Know of no locality particularly unhealthy.

9. I should report to the town council nuisances dangerous to the public health if I knew of any such, or should order them abated of my own option.

10. No knowledge that any serious disease of domestic animals has largely prevailed.

1. NORTH KINGSTOWN.

2. Health Officer, Thomas W. Peirce.

3. There have been no epidemics or any large prevalence of contagious or infectious diseases in town during 1889.

5. None of the sick were isolated by my order.
6. No inspection of premises made where sickness prevailed.
7. Nothing required any particular inspection. Something might be done for out-houses and sink-drains, but there is nothing serious in any of these things at present.
8. Do not know of any location in town that seems to be particularly unhealthy to any considerable number of persons.
9. I have nothing to report. I would if the occasion required.
10. No serious disease of domestic animals has largely prevailed, to my knowledge, during the year.

SOUTH KINGSTOWN and RICHMOND.

No reports from Health Officers.

1. WESTERLY.
2. Health Officer, H. W. Rose.
3. No large prevalence of contagious or infectious diseases in town during 1889.
6. No inspection of premises made, as to their sanitary condition, by order of the town authorities.
7. I have made several inspections from my own option ; mostly nuisances.
8. No location in town particularly unhealthy.
9. Reports to the town council of nuisances dangerous to the public health are made, when necessary.
10. No serious disease of domestic animals has prevailed.

COMPARATIVE PREVALENCE

OF TWELVE IMPORTANT ACUTE DISEASES IN THE TOWNS.

For the purpose of the comparison of any one year with others, the following six Tables will present the varying degrees of the prevalence of twelve acute diseases of importance, as causes of death during the six years, 1884-1889.

In these Tables the appearance of the most important of the common contagious diseases, with a few others not contagious, may be traced as they occurred in the different towns, with different degrees of prevalence from year to year.

The *mortality* from that class of diseases styled zymotic, quite approximately corresponds, in a majority of instances, with the relative extent of the prevalence or number of such diseases.

A fair estimate, therefore, of the whole number of cases of each of such diseases, occurring in the State during each of the years represented, may be made by reference to the alphabetical classification and percentage Tables of mortality in the Registration Reports for these years.

Comparative Prevalence of Twelve Important Acute Diseases during 1884.

TOWNS.	Bronchitis.	Cholera Infantum.	Croup.	Diphtheria.	Diarrhea and Dysentery.	Fever, Typhoid.	Fever, Malarial.	Measles.	Pneumonia.	Rheumatism.	Scarlatina.	Whooping Cough.
Barrington	=	=	=	0	=	—	+	—	+	=	0	—
Bristol	=	—	—	0	—	+	—	0	—	—	—	—
Warren	=	=	—	0	=	=	=	+	+	+	0	+
Coventry	=	=	—	=	+	—	..	—	+	+	+	:
East Greenwich	=	=	—	—	=	=	=	0	=	=	=	=
West Greenwich	=	—	=	..	—	—	0	0	=	+	=	—
Warwick	+	=	+	—	—	—	=	*	=	=	:	—
Jamestown	=	—	0	0	—	—	0	0	—	—	0	—
Little Compton	—	—	0	..	—	=	0	*	—	—	0	=
Middletown	=	—	0	..	—	=	0	—	=	0	=	—
New Shoreham	—	—	0	—	—	+	0	*	—	—	0	0
Portsmouth	=	—	0	0	—	—	0	0	—	—	—	..
Tiverton	=	—	0	..	—	—	0	—	=	=	—	:
Newport City	=	—	—	=	..	—	=	=	+	+
Barrillville	—	—	—	=	=	*	0	0	+	=	+	0
Cranston	=	=	—	—	—	=	+	—	=	+	=	—
Cumberland	+	—	+	+	—	—	*	..	—	=	=	*
East Providence	=	—	—	=	—	+	=	—	+	+	=	—
Foster	—	—	—	—	..	+	=	=	0	..
Glocester	—	—	..	=	=	=	0	0	+	=	=	0
Johnston	=	+	—	—	—	=	+	—	=	=	+	—
Lincoln	=	=	—	=	=	—	+	..	—	—	=	=
North Providence	=	—	..	=	—	=	+	—	+	+	—	0
North Smithfield	=	=	—	..	=	=	—	0	=	+	—	0
Pawtucket	=	—	+	+	=	=	+	+	—	—	+	=
Scituate	=	=	—	—	—	=	+	—	+	+	+	0
Smithfield	=	=	—	—	=	=	+	0	=	+	=	..
Woonsocket	=	=	—	..	=	+	+	0	=	+	+	0
Providence City	=	+	=	=	—	—	=	=	+	+	+	=
Charlestown	=	—	..	—	+	—	—	0	—	—	..	+
Exeter	=	—	—	..	—	—	0	0	—	+	—	0
Hopkinton	=	—	..	=	=	=	—	0	—	=	—	+
North Kingstown	=	=	—	—	=	=	—	0	—	=	=	0
South Kingstown	=	=	—	..	=	=	..	0	+	+	—	0
Richmond	=	—	..	—	+	=	—	0	—	=	..	*
Westerly	=	..	—	..	=	—	=	0	+	=	*	+

The signs or characters used in the above Table indicate the degrees of prevalence of the diseases named, as follows: The * indicates an epidemic prevalence; the sign + a large prevalence; the sign = a moderate prevalence; the sign — a small prevalence; the dots a very small prevalence; and the 0 no prevalence, according to the returns.

Comparative Prevalence of Twelve Important Acute Diseases during 1885.

TOWNS.	Bronchitis.	Cholera Infantum.	Croup.	Diphtheria.	Diarrhea and Dysentery.	Fever, Typhoid.	Fever, Malarial.	Measles.	Pneumonia.	Rheumatism.	Scarlatina.	Whooping Cough.
Barrington	=	—	—	..	—	=	+	0	=	=	..	—
Bristol	+	—	—	+	+	=	0	—	—	=	—	=
Warren	=	—	..	—	=	=	=	0	+	=	—	—
Coventry	—	..	=	+	+	..	—	*	..	+	—	+
East Greenwich	=	+	—	—	+	—	—	0	=	—	..	..
West Greenwich	—	—	—	=	+	—	..	—	..	=	..	—
Warwick	=	—	=	=	=	=	=	=	=	+	..	=
Jamestown	=	=	—	0	0	=	=	..	0
Little Compton	+	+	—	0	=	=	—	+	+	=	0	+
Middletown	+	—	—	=	=	—	..	0	=	=	0	0
New Shoreham	=	..	0	—	=	=	0	0	0	=	..	..
Portsmouth	=	..	—	—	=	—	..	+	=	=	..	0
Tiverton	+	=	—	..	=	=	0	+	=	—	0	=
Newport City	+	—	—	=	=	—	..	0	+	=	—	0
Burrillville	=	—	0	—	—	—	..	*	=	—	0	*
Cranston	=	—	=	=	=	=	+	—	+	=	—	..
Cumberland	=	=	=	..	—	=	+	0	—	=	..	..
East Providence	=	=	+	+	—	=	—	—	0	—	—	+
Foster	=	..	—	—	=	..	0	—	=	=	0	=
Glocester	+	0	0	0	—	=	0	—	+	=	0	*
Johnston	=	—	+	+	=	=	+	—	+	=	—	..
Lincoln	=	=	=	..	=	=	+	0	—	=	..	—
North Providence	=	—	—	=	=	=	=	—	+	+	—	..
North Smithfield	=	—	—	—	=	=	—	=	=	—	..	+
Pawtucket	+	=	—	=	—	—	+	+	=	=	+	..
Scituate	—	=	0	+	=	=	—	0	=	=	0	0
Smithfield	+	—	..	=	—	—	—	0	—	=	..	..
Woonsocket	=	=	=	=	=	=	+	—	=	—	..	*
Providence City	+	=	=	=	=	—	=	=	+	=	—	+
Charlestown	+	0	..	—	—	—	=	=	=	=	=	—
Exeter	=	—	—	—	0	0	=	—	..	..
Hopkinton	=	—	—	—	=	—	—	0	=	—	..	..
North Kingstown	=	=	—	=	=	—	—	..	—	—	..	0
South Kingstown	=	=	—	—	—	—	..	0	—	—	—	..
Richmond	=	—	—	—	=	—	—	0	=	=	..	..
Westerly	=	—	=	=	=	..	=	=	*	..

The signs or characters used in the above Table indicate the degrees of prevalence of the diseases named, as follows: The * indicates an epidemic prevalence; the sign + a large prevalence; the sign = a moderate prevalence; the sign — a small prevalence; the dots a very small prevalence; and the 0 no prevalence, according to the returns.

Comparative Prevalence of Twelve Important Acute Diseases during 1886.

NAMES.	Bronchitis.	Cholera Infantum.	Croup.	Diphtheria.	Diarrhea and Dysentery.	Fever, Typhoid.	Fever, Malarial.	Measles.	Pneumonia.	Rheumatism.	Scarlatina.	Whooping Cough.
Barrington	+	—	—	—	—	—	≡	—	≡	≡	::	—
Bristol	≡	≡	—	+	≡	—	—	0	—	+	0	—
Warren	≡	—	—	≡	≡	—	≡	—	+	—	—	—
Coventry	+	—	≡	≡	≡	—	+	::	—	+	—	≡
East Greenwich	≡	—	—	—	≡	—	—	0	≡	≡	+	≡
West Greenwich	≡	—	≡	≡	≡	::	::	—	—	+	::	≡
Warwick	≡	≡	≡	—	≡	—	+	+	—	≡	+	+
Jamestown	≡	—	—	::	≡	—	0	::	—	≡	0	0
Little Compton	—	—	::	::	—	::	0	0	—	≡	0	0
Middletown	—	≡	—	—	—	::	0	::	—	—	0	0
New Shoreham	—	—	0	0	—	0	0	0	::	::	0	0
Portsmouth	—	—	0	—	—	—	0	0	≡	≡	0	0
Tiverton	::	≡	0	—	::	0	0	::	≡	≡	0	0
Newport City	—	≡	—	—	≡	—	0	::	—	≡	::	—
Burrillville	≡	—	—	—	≡	—	::	0	≡	≡	0	*
Cranston	+	≡	—	—	+	≡	+	—	+	≡	—	≡
Cumberland	≡	—	0	—	—	::	*	0	—	≡	—	—
East Providence	+	≡	—	≡	—	::	*	::	≡	≡	—	—
Foster	≡	—	—	—	≡	—	::	0	≡	≡	0	0
Glocester	≡	0	0	—	≡	0	::	0	≡	—	0	*
Johnston	+	≡	≡	≡	+	≡	+	≡	+	≡	≡	+
Lincoln	≡	≡	::	+	—	::	+	0	—	≡	—	—
North Providence	≡	≡	—	≡	—	—	—	::	≡	≡	—	—
North Smithfield	≡	≡	—	≡	—	—	—	::	≡	≡	::	...
Pawtucket	≡	+	—	≡	≡	—	+	::	≡	≡	≡	—
Scituate	≡	≡	—	::	≡	≡	+	*	+	≡	0	*
Smithfield	≡	≡	—	≡	—	—	—	—	≡	≡	0	::
Woonsocket	+	+	≡	≡	≡	—	+	—	≡	≡	—	::
Providence City	+	≡	≡	+	≡	≡	≡	+	+	—	—	+
Charlestown	≡	::	—	—	+	::	::	0	≡	+	::	—
Exeter	+	::	::	::	≡	—	0	*	—	+	0	::
Hopkinton	+	—	::	::	+	—	—	+	+	+	0	::
North Kingstown	≡	—	—	—	≡	—	::	0	≡	≡	—	::
South Kingstown	≡	≡	::	::	+	::	::	0	≡	≡	+	*
Richmond	+	::	—	—	+	—	::	—	≡	+	::	—
Westerly	≡	—	—	::	+	—	≡	0	≡	+	≡	+

The signs or characters used in the above Table indicate the degrees of prevalence of the diseases named, as follows: The * indicates an epidemic prevalence; the sign + a large prevalence; the sign = a moderate prevalence; the sign — a small prevalence; the dots a very small prevalence; and the 0 no prevalence, according to the returns.

Comparative Prevalence of Twelve Important Acute Diseases during 1887.

TOWNS.	Bronchitis.	Cholera Infantum.	Croup.	Diphtheria.	Diarrhea and Dysentery.	Fever, Typhoid.	Fever, Malarial.	Measles.	Pneumonia.	Rheumatism.	Scarlatina.	Whooping Cough.
Barrington	—	==	==	+	==	—	==	—	==	==	==	0
Bristol	—	—	==	—	—	—	==	==	+	..
Warren	==	==	==	+	==	—	==	—	==	+	==	0
Coventry	—	—	—	==	—	..	—	==	—	—	*	..
East Greenwich	—	—	..	—	+	==	==	—	—	..
West Greenwich	—	—	..	0	—	—	==	—	..
Warwick	+	..	==	—	==	+	+	*	—	+	*	*
Jamestown	==	—	—	—	—	0	—	—	—	..
Little Compton	—	..	—	—	0	—	==	==	0	0
Middletown	—	—	..	0	==	—	—	..	—
New Shoreham	—	—	—	—	0	0	==	==	0	0
Portsmouth	—	—	—	—	0	0	==	==	0	0
Tiverton	—	—	—	==	0	==	0	—	==	==	0	0
Newport City	==	—	..	—	—	—	0	+	==	==	—	==
Burrillville	—	—	—	—	—	0	—	—	0	0
Cranston	—	—	—	..	—	..	+	—	—	—	+	—
Cumberland	==	==	*	—	..	+	—	..
East Providence	—	—	—	+	==	..	==	..	+	—	+	0
Foster	—	—	—	+	—	..	*	—	—	0
Gloicester	—	0	..	..	==	—	==	0	—	—	0	0
Johnston	+	==	—	==	+	—	+	+	+	+	+	—
Lincoln	—	==	==	*	+	==
North Providence	==	==	—	==	==	—	==	==	+	==	+	—
North Smithfield	+	..	—	+	—	==	==	+	..
Pawtucket	==	—	—	+	—	..	—	—	==	+
Seituate	—	—	..	—	==	+	+	—	—	+
Smithfield	==	—	..	—	—	..	+	—	==	==	—	0
Woonsocket	==	—	—	==	==	—	==	—	==	==	*	..
Providence City	+	==	==	+	==	—	+	*	+	==	*	==
Charlestown	—	0	==	*	==	..	..	..	—	==	0	..
Exeter	0	0	+	..	..	0	0	0	0	0
Hopkinton	==	..	==	==	==	—	==	==	+	—	—	..
North Kingstown	0	==	+	—	—	0	0	0	..	0
South Kingstown	—	—	0	..	==	—	..	*	—	—	0	0
Richmond	—	0	+	*	==	..	..	—	—	==	0	..
Westerly	+	==	==	+	+	==	==	—	==	==	==	—

②—The signs or characters used in the above Table indicate the degrees of prevalence of the diseases named, as follows: The * indicates an epidemic prevalence; the sign + a large prevalence; the sign = a moderate prevalence; the sign — a small prevalence; the dots a very small prevalence; and the 0 no prevalence, according to the returns.

Comparative Prevalence of Twelve Important Acute Diseases during 1888.

TOWNS.	Bronchitis.	Cholera Infantum.	Croup.	Diphtheria.	Diarrhea and Dysentery.	Fever, Typhoid.	Fever, Malarial.	Measles.	Pneumonia.	Rheumatism.	Scarlatina.	Whooping Cough.
Barrington	==	—	::	::	==	==	—	0	+	—	0	0
Bristol	::	::	—	::	==	0	*	0	—	==	==	0
Warren	+	—	—	—	==	—	==	0	+	==	0	0
Coventry	—	==	==	—	==	—	—	::	—	+	*	*
East Greenwich	::	—	::	—	—	—	—	0	==	+	*	+
West Greenwich	—	—	—	::	==	0	::	::	—	==	—	::
Warwick	+	==	—	::	==	—	+	::	+	==	+	—
Jamestown	==	—	::	::	—	0	—	0	==	—	::	::
Little Compton	—	0	::	—	—	0	—	—	==	==	—	—
Middletown	==	==	—	—	—	0	—	0	==	—	—	—
New Shoreham	—	—	—	—	—	—	—	—	—	—	—	—
Portsmouth	==	==	—	—	==	0	—	0	—	—	—	—
Tiverton	0	0	—	0	—	0	==	==	==	==	==	—
Newport City	==	==	—	—	—	0	—	0	+	—	—	::
Burrillville	==	—	0	0	==	0	+	0	+	==	—	0
Cranston	+	==	—	==	==	+	==	::	—	—	==	::
Cumberland	==	==	::	==	==	+	—	—	—	—	—	—
East Providence	+	==	—	==	==	==	—	—	==	==	—	—
Foster	—	==	0	::	==	—	==	0	==	==	0	0
Glocester	==	—	0	0	==	0	==	0	+	==	0	0
Johnston	+	+	—	==	==	+	+	—	==	—	==	—
Lincoln	+	+	—	—	—	+	+	0	—	—	—	::
North Providence	+	+	—	—	==	*	==	*	—	+	*	—
North Smithfield	+	==	—	—	—	+	==	—	==	==	+	::
Pawtucket	+	+	—	==	==	==	+	::	==	==	—	—
Scituate	+	==	::	::	==	—	—	::	—	::	==	::
Smithfield	==	==	::	::	==	==	::	—	—	—	—	—
Woonsocket	+	+	::	—	==	+	+	—	==	==	*	::
Providence City	+	==	—	==	==	==	+	—	==	==	==	+
Charlestown	==	0	0	—	==	==	==	0	==	—	0	*
Exeter	+	0	0	::	==	0	—	0	==	+	0	0
Hopkinton	+	—	::	—	==	—	*	0	—	+	—	—
North Kingstown	==	::	::	—	+	—	::	0	==	—	—	0
South Kingstown	==	+	::	::	==	—	==	0	==	::	—	—
Richmond	+	==	—	—	==	—	==	0	==	+	—	—
Westerly	==	==	::	—	==	==	==	0	==	+	—	::

The signs or characters used in the above Table indicate the degrees of prevalence of the diseases named, as follows: The * indicates an epidemic prevalence; the sign + a large prevalence; the sign = a moderate prevalence; the sign — a small prevalence; the dots a very small prevalence; and the 0 no prevalence, according to the returns.

Comparative Prevalence of Twelve Important Acute Diseases during 1889.

TOWNS.	Bronchitis.	Cholera Infantum.	Croup.	Diphtheria.	Diarrhoea and Dysentery.	Fever, Typhoid.	Fever, Malarial.	Measles.	Pneumonia.	Rheumatism.	Scarlatina.	Whooping Cough.
Barrington	-	-	-	-	-	=	=	+	+	-	0	0
Bristol	=	-	..	0	-	-	0	0	-	-	0	0
Warren	-	-	..	-	=	+	0	+	+	-	0	0
Coventry	=	=	..	-	+	=	-	*	=	+	-	0
East Greenwich	+	=	=	-	-	=	..	-	=	-	-	0
West Greenwich	=	-	-	..	-	=	..	-	=	+	-	-
Warwick	=	=	..	-	=	=	-	*	=	-	-	-
Jamestown	=	-	=	-	0	-	=	=	..	0
Little Compton	=	-	-	..	=	-	0	0	=	=	..	0
Middletown	=	-	=	-	0	..	-	=	-	0
New Shoreham	=	-	..	-	=	-	0	-	-	-	..	0
Portsmouth	=	=	-	0	0	=	=	..	0
Tiverton	-	-	+	-	-	-	=	=	-	0
Newport City	=	-	-	-	+	-	0	..	=	=	-	..
Burrillville	+	=	=	-	=	=	0	+	=	-	-	+
Cranston	=	-	-	-	=	=	=	+	+	=	-	=
Cumberland	=	=	=	*	=	+	*	-	+	=	-	*
East Providence	+	=	-	-	=	-	=	=	+	=	-	+
Foster	=	=	-	-	=	=	0	*	=	=	0	*
Glocester	+	+	..	-	=	-	0	*	-	-	0	+
Johnston	+	=	-	=	+	-	+	+	=	=	-	+
Lincoln	=	=	-	+	=	=	+	=	=	-	-	0
North Providence	+	=	-	-	=	=	-	-	=	=	-	-
North Smithfield	=	-	-	+	=	+	-	-	=	=	+	+
Pawtucket	-	=	-	=	-	-	+	-	=	=	-	=
Scituate	+	=	..	-	=	-	..	-	+	=	0	+
Smithfield	+	-	..	-	+	-	-	*	-	=	0	=
Woonsocket	=	-	=	*	=	=	-	=	=	=	*	*
Providence City	+	=	-	=	-	-	-	+	+	+	-	+
Charlestown	-	-	=	=	0	0	=	=	*	*
Exeter	=	-	=	=	0	=	-	=	0	0
Hopkinton	+	..	=	=	*	=	-	*	-	+	-	-
North Kingstown	=	-	-	-	=	=	..	-	=	-	0	*
South Kingstown	+	=	..	+	=	+	-	0	=	=	0	0
Richmond	=	-	-	-	+	=	..	+	=	+	-	-
Westerly	=	0	=	-	..	0	=	-	-	0

The signs or characters used in the above Table indicate the degrees of prevalence of the diseases named, as follows: The * indicates an epidemic prevalence; the sign + a large prevalence; the sign = a moderate prevalence; the sign - a small prevalence; the dots a very small prevalence; and the 0 no prevalence, according to the returns.

METEOROLOGY.

It has been remarked in previous reports of the Board that the influences of the meteorological conditions of the atmosphere, as well as the floating matter suspended therein, as causes of disease, are recognized and acknowledged by all pathologists; and the following tables are therefore introduced, as heretofore, for the purpose of comparing the large prevalence of certain diseases at different periods of the year, with the temperature, the barometric pressure, the relative humidity, prevailing direction of the wind and other conditions of the atmosphere, and also the amount of rainfall during each month of the year. All of the said diseases may be found in the report upon the registration of deaths by MONTHS, in Table VII of the Registration Report.

The first table is compiled from the monthly reports of the City Engineer of Providence, and shows the mean, maximum and minimum temperature of the different months, and the extremes and average daily ranges of the same, the rainfall and prevailing direction of the wind.

The second table will give a more comprehensive monthly summary of observations during 1889, including a larger number of atmospheric conditions for each month, and also yearly summaries for each of the eight preceding years.

It is condensed from the annual summary of monthly observations at Hope Reservoir and the City Hall.

The meteorological observations taken on Block Island are furnished by the courtesy of the officers of the Signal Office, War Department, Washington, D. C.

TABLE I.

Temperature, Rainfall and Prevailing Direction of the Wind, for each Month during the year 1889.

MONTHS, 1889.	TEMPERATURE.							Total amount of Rain or Melted Snow in inches.	Prevailing Direction of the Wind.
	Monthly Mean.	Maximum.	Minimum.	Monthly Range.	Greatest Daily Range.	Least Daily Range.	Average Daily Range.		
January	35.7	58.	11.	47.	18.	1.	12.	5.62	N. W.
February	26.4	47.5	0.5	47.	30.5	3.5	13.5	2.55	W.
March.....	38.7	65.5	22.5	43.	25.	2.	13.	1.98	N.
April	49.	75.	32.5	42.	29.	3.	16.	4.07	N.
May.....	61.	85.	40.5	44.	32.5	4.	19.5	4.71	S.
June.....	69.7	92.5	49.5	43.	25.	6.	16.3	2.90	S.
July.....	71.2	90.5	54.5	36.	26.5	5.	16.	9.49	S.
August....	63.2	83.5	49.5	34.	27.5	4.	16.7	5.83	N. W.
September.....	63.2	81.	43	38.	24.	3.	15.	5.23	N. E.
October... ..	49.4	69.5	32.	37.5	24.5	3.5	13.4	4.52	N.
November.....	45.3	64.	23.	41.	20.5	4.5	11.	6.39	N. W.
December	39.2	64.5	11.	53.5	27.	5.5	21.5	2.62	N.
For the year	51.4	92.5	0.5	42.3	...	...	...	55.91	

Mean temperature for the year 1889 was 51.4 Fah. Total amount of rain and melted snow, 55.91 inches.

TABLE II.—CONTINUED. *Summary of Meteorological Observations at Hope Reservoir and City Hall, for the years 1881-1883.*

MONTHS.	BAROMETER. Reduced to Sea Level, and to 32°				THERMOMETERS.				Relative Humidity.	WIND.				WEATHER.				RAIN AND SNOW.	
	Mean.	Maximum.	Minimum.	Range.	Mean.	Maximum.	Minimum.	Range.		Mean Velocity.	Prevailing Direction. No. of Days it was.	Variable. N. W. S. W. S. E. E. E. N. E.	Fair.	Rain or Snow.	All others.	Mean amount of Rain or Snow.	Amount of Rain or Melted Snow in Inches.	Depth of Snow in Inches.	
Yearly Summary for 1883.																			
Mean Force.																			
Means for the year.	30.05	.....	.....	1.08	48.2	.....	.....	45.5	72	.....	.....	.....	.....	.....	.....	5.1	.....	.....
Totals for the year.	.....	.....	.....	.....	.....	.....	.....	.....	.....	43 31	7 11 44 51 35 70 73	45	136	17	156	11	45.71	73.00
Extremes.....	.....	30.77	28.88	1.89	.....	93.	-9.5	102.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yearly Summary for 1882.																			
Means for the year.	30.03	.....	.....	1.03	49.2	.....	.....	46.	72	.....	.....	.....	.....	.....	.....	5.3	.....	.....
Totals for the year.	.....	.....	.....	.....	.....	.....	.....	.....	.....	54 26	2 16 46 30 40 82 60	44	148	31	136	6	51.84	74.00
Extremes.....	.....	30.79	29.22	1.57	.....	95.	-11.	106.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yearly Summary for 1881.																			
Means for the year.	30.00	.....	.....	1.08	49.6	.....	.....	44.5	73	.....	.....	.....	.....	.....	.....	5.1	.....	.....
Totals for the year.	.....	.....	.....	.....	.....	.....	.....	.....	.....	47 33 12	9 50 47 20 80 67	80	73	54	130	28	52.96	27.50
Extremes.....	.....	30.80	28.97	1.83	.....	96.	-4.	100.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
The mean velocity and mean force of the wind and amount of cloud are expressed approximately in figures from 0 to 10. Multiplying the mean force by four will give approximately the mean velocity, per hour, in miles.																			

TABLE III.

Statement showing the air pressure, reduced to sea level; the temperature, precipitation and the prevailing direction of the wind for each month of the year 1889, at Block Island, R. I.

1889. MONTHS.	BLOCK ISLAND, R. I.											
	PRESSURE.			TEMPERATURE.							Precipitation in inches.	Prevailing Wind direction.
	Mean.	Highest.	Lowest.	Mean.	Maximum.	Minimum.	Absolute Range.	Mean Daily Range.	Greatest Daily Range.	Least Daily Range.		
January . . .	30.02	30.63	29.14	36.1	56	10	46	9.6	21	4	2.16	N. W.
February . . .	30.11	30.85	29.39	27.0	48	2	46	10.6	20	3	1.57	N. W.
March.	29.87	30.48	29.06	37.2	49	24	25	8.8	14	3	2.30	N. E.
April.	29.99	30.58	29.37	44.1	58	32	26	9.4	19	2	2.10	N. E.
May.	29.99	30.39	29.65	53.8	70	40	30	11.3	22	5	3.21	W.
June.	30.05	30.49	29.60	62.9	76	52	24	10.1	19	5	2.84	S. W.
July.	30.01	30.32	29.71	67.6	81	57	24	9.8	18	4	2.92	S. W.
August. . . .	30.08	30.35	29.76	67.2	80	56	24	8.5	14	4	3.37	S. W.
September. .	30.05	30.34	29.45	63.0	74	49	25	8.0	14	2	3.41	S. W.
October. . . .	30.03	30.41	29.60	51.2	66	36	30	9.5	15	4	3.11	N. E.
November. . .	30.07	30.64	29.34	46.6	62	25	37	9.5	26	5	4.86	N. W.
December. . .	30.15	30.92	29.39	41.4	57	18	39	12.3	16	3	0.95	N. W.
Annual.	30.03	30.92	29.06	49.8	81	2	31	9.8	..	..	32.80	N. W.

Signal Office, War Department, Washington City,

March 6th, 1890.

APPENDIX A.

WATER WORKS

IN

RHODE ISLAND.



WATER WORKS IN RHODE ISLAND.

A very large proportion of the population of Rhode Island, is supplied with water for domestic use from public water works. The further and very large employment of water from the same sources in the various industrial pursuits, in the extinguishment of fires, the supply of public and private fountains, etc., etc., makes the subject of such works of large interest and importance to the citizens of the State.

The importance of the subject, in a *sanitary* point of view, can scarcely be over estimated, and the usefulness of a public water supply from unpolluted sources for domestic use, has become the recognized sentiment of a large majority of the people.

Numerous conferences have been held and questions asked at the office of the State Board of Health, in regard to the formation of Water Works Associations, methods of procedure, etc., and always with the inquiry of the location, cost, management, success, and many other particulars respecting the water works already constructed. It is to give some idea of the cost, localities, sources of supply and other items, that the following descriptions, which are not all fully completed to date, are given, which in addition to information obtained by personal solicitation, is much more largely derived from the Manual of American Water Works, edited by M. N. Baker, Ph. B., and published by Engineering News, New York. For extensions of water services et al during 1889, see Reports from Towns, pp. 46-84.

BRISTOL.

Bristol and Warren Water Works commenced in 1882. This system includes Warren as well as Bristol, and also Barrington, including Nayatt Point. The source of the water supply, Kickemuit river.

Water raised by pump to tank by a Knowles pump. Daily capacity one million (1,000,000) gallons. Dimensions of tank 40 feet in diameter, by 35 feet high, capacity of tank three hundred twenty-nine thousand (329,000) gallons.

There are now constructed 14 miles of mains, 350 taps. Present consumption of water about two hundred fifty thousand (250,000) gallons. Ordinary pressure sixty pounds, fire pressure eighty pounds. Capital stock, two hundred fifty thousand (\$250,000) dollars, no bonded debt. The annual operating expenses not positively ascertained. The annual revenue from the consumers about ten thousand (\$10,000) dollars. I. F. Williams, President; G. Norman Weaver, Newport, Treasurer; Sidney Dean, of Warren, Secretary.

BARRINGTON.

This system is included with that of Bristol. Originally designed to supply Nayatt Point and still continues to do so.

Built by the Barrington Water Co. in 1887. The main pipes are of wrought iron, service pipes cast iron. Taps thirty, meters thirty. The consumption not able to ascertain exactly.

Cost fifteen thousand (\$15,000) dollars, no remaining indebtedness. Length of main pipes three miles. President, Lucian Sharpe; Treasurer, C. H. Merriman.

WARREN.

Warren Water Works, built in 1882, and is part of the system of the Bristol and Warren Water Works. The main pipes wrought iron and cement, length eight miles. The services wrought iron and cement. Taps 224, hydrants 58, consumption about two hundred fifty thousand (250,000) gallons. Ordinary pressure sixty pounds, fire pressure also sixty. Benjamin B. Martin, Superintendent.

COVENTRY.

Proposed System.—The Warwick and Coventry Water Co. were organized in June, under a State charter, to supply water to the villages in Warwick and Coventry about the south branch of the Pawtuxet river. Fifty thousand dollars of stock has been issued. Supply will be from wells by pumping to stand-pipe. Eventually, a population of eight thousand (8,000) will be supplied, requiring 14 miles of pipe, but at present only three villages, with a population of four

thousand (4,000) will be supplied. This will require $6\frac{1}{4}$ miles of pipe and 60 hydrants. President, E. Lapham ; Secretary, H. B. Barton, Centreville, Engineer for town of Warwick.

EAST GREENWICH.

East Greenwich Water Works, built in 1886 by the East Greenwich Water Supply Co., under the National Water Works Syndicate, Boston, Mass. Engineer, A. W. Forbes, Boston, Mass.

Source of water supply, Hunt's river. Raised by a pump to a stand-pipe. Pump machinery, Worthington pump. Daily capacity one million (1,000,000) gallons. Stand-pipe from Cunningham Iron Works, Boston. Capacity one hundred sixty thousand (160,000) gallons. Main pipes cast iron, length nine miles. Services wrought iron. Pipes and specials made by Wood & Co., Philadelphia, Pa. Pipes laid by Ferris & Halladay, Jersey City, N. J. Taps 180, hydrants 52, made by Wood & Co.; valves by the same. Consumption 100,000 gallons. Ordinary pressure 50 pounds; fire pressure 200 pounds.

Original cost about \$100,000. Capital stock, \$75,000. Bonded debt, \$73,000. Annual operating expenses about \$3,000. Annual revenue: consumers about \$3,000; hydrant rentals, \$28.88.

George Alexander, President; B. C. Mudge, Treasurer, 70 Kilby street, Boston; John L. Congdon, Superintendent, East Greenwich.

WARWICK.

South western section to be supplied by the Warwick and Coventry Water Co. See Coventry for reference. Introduction for general use under consideration, and will doubtless be established at no greatly distant date.

NEWPORT.

Newport Water Works built in 1876-7, by George H. Norman, Newport, under a fifty years' franchise, and owned by him till June, 1881, when a company was organized and took possession of the works. Designing Engineer, George H. Norman; Contracting Engineer, G. Norman Weaver. Most of the work was done by the original owner.

Water Supply.—Easton's and Paradise ponds, pumping to reservoir from two stations, that at the first pond being one, and at the second, three miles from the city. Easton's pond was formed by impounding

the water of $4\frac{1}{2}$ square miles drainage area by two dams of sand, one 2,800 feet long, 15 feet high, and 12 feet wide on top, with the water slope covered with rip-rap; the other, 2,000 feet long, 4 feet high and 6 feet wide on top. The pond has an area of one hundred and sixty acres.

Pumping Machinery.—Combined daily capacity seven million (7,000,000) gallons; one Knowles $19\frac{1}{2}$ inch water cylinder and 36 inch stroke, one Carr-Selden of 12 inch water cylinder and 24 inch stroke, one Knowles high pressure, one three million (3,000,000) gallons Curtis pump. The lift from the first pumping station is 160 feet.

Distributing Reservoir.—Capacity ten million (10,000,000) gallons; its flow line is 60 feet above highest point in the city.

Distribution.—Mains, cast iron, wrought iron and cement, 50 miles. Services, wrought iron and cement. Taps, 2,500. Meters, Crown, Worthington, 12. Hydrants, kind not given, 220. Consumption one million gallons. Pressure, ordinary, 55 pounds.

Financial.—Cost seven hundred thousand (\$700,000) dollars. Capital stock, seven hundred and fifty thousand (\$750,000) dollars. No debt. Annual operating expenses twenty thousand (\$20,000) dollars. Annual revenue: consumers, sixty thousand (\$60,000) dollars; city, ten thousand (\$10,000) dollars.

Management.—President, George H. Norman; Secretary, R. S. Franklin; Treasurer and Superintendent, William S. Slocum.

CRANSTON.

Various localities in the town of Cranston, including the State Institutions, are supplied from the Providence system of Water Works.

CUMBERLAND.

Valley Falls, part of Lonsdale and Valley Falls division of Pawtucket Water Works, all data to be found under Pawtucket Water Works.

EAST PROVIDENCE.

Water Works built in 1880 by the town. Engineer, C. H. M. Blake. Contractor, J. J. Newman, Providence. After the original plant was completed the distribution system was turned over to the Pawtucket Water Works.

Water Supply.—Pawtucket Water Works.

Distribution.—Originally 8 miles of mains and 42 hydrants.

Financial.—East Providence receives a rebate of 25 per cent. on all rates collected from consumers.

All data included under Pawtucket.

JOHNSTON.

Johnston water supply commenced in 1873 by the extension of the Providence system ; about three-fourths of the population in the eastern section of the town are supplied. Statements in regard to late extensions found under Providence report.

LINCOLN.

CENTRAL FALLS.—Water Works built in 1881 by the Fire District.

Water Supply.—Pawtucket Water Works.

Distribution, 1886.—Mains, iron, 11.5 miles. Services wrought iron. Taps, 800. Meters not given. Hydrants, the kind not given, 72. Consumption not ascertained. Pressure, ordinary, 100 pounds ; fire, 100 pounds.

Financial.—Cost, \$50,000. Debt, \$37,500. Interest, 5 per cent. Annual operating expenses three thousand (\$3,000) dollars. Annual revenue : consumers, \$4,200 ; city, \$1,000.

Management.—The Fire District operate the works, taking the supply from the Pawtucket Water Works, the officers of which collect the rents, and give Central Falls a rebate of 40 per cent.

LONSDALE.—The plant was built and operated as a part of the Lonsdale and Valley Falls division of the Pawtucket Water Works. All data included under Pawtucket.

NORTH PROVIDENCE.

A large reservoir of the Providence Water Works erected at Fruit Hill. Lymanville supplied from the Providence Water Works.

NORTH SMITHFIELD.

A portion of the town supplied by the Woonsocket Water Works Company.

PAWTUCKET.

Pawtucket Water Works built in 1877-9 by city. Engineer, Walter H. Sears. Supplies Ashton, Central Falls, East Providence, Lonsdale and Valley Falls.

Water Supply.—Abbott's Run, by pumping to reservoir through distributing mains. Water is impounded by a dam forming Happy Hollow pond, having a drainage area of 26 square miles, and a capacity of seventy-two millions (72,000,000) gallons.

Pumping Machinery.—Two Corliss pumping engines, daily capacity three million (3,000,000) gallons each. A new pumping station is being built with provisions for three six million (6,000,000) gallon pumps, water to be taken from a gravel filter bed near Blackstone river.

Reservoir.—Capacity twenty-one million (21,000,000) gallons.

Distribution.—Mains, cast iron, 98 miles. Services, tarred wrought iron. Taps, 4,795. Meters, 2,900; mostly Crown and Union, with a few Desper, Worthington, Ball & Fitts, Duplex, Equitable and Empire. Hydrants, Fales & Jenks, 778. Valves, Chapman.

Consumption.—3,176,193 gallons. Pressure, ordinary, 65 to 130; fire, 65 to 130.

Financial.—Cost, \$1,336,658. Debt, \$1,336,658. Interest 4 and 5 per cent. Sinking fund, \$120,000. Annual operating expenses, \$23,141. Annual revenue: consumers, \$82,000; cities, \$14,868. Rebates were paid to the amount of \$3,633. Hydrant rentals, total, \$12,640.

Management.—Three commissioners; Superintendent, Edwin Darling; Pumping Engineer, Jno. Walker.

PAWTUCKET.—Pawtucket, a part of Warwick and Cranston water supply, introduced in 1880 for general use from the Providence Water Works, through about two miles of eight inch pipe. See extensions under Providence city.

PROVIDENCE.

Providence, at head of navigation on Narragansett Bay, thirty-five miles from the ocean. Two small rivers meet in the centre of the city, and on the east is the Blackstone river, which, near its mouth, becomes a tidal basin, called the Seekonk river. The confluence of these three rivers form the Providence river. The business part of

the city is near the river and about ten feet above tide-level ; a second part rises on each side of the river seventy-five feet above tide-level, while a small section is at an elevation of from 90 to 100 feet. Engaged largely in commerce and manufacturing. Settled in 1636 ; incorporated a city in 1832.

History.—Built in 1870–6 by city. Engineer, J. Herbert Shedd, Providence. The city also supplies parts of Cranston, and the parts of Johnston and North Providence within one mile of the city limits, and the village of Pawtuxet. Terms same as for Providence.

The first public water supply was introduced in 1772 by a company who distributed spring water through three-fourth mile of wooden logs. In the same year the “Rawson’s Fountain Society” collected spring water in a reservoir $13\frac{1}{2}$ by 30 feet and 10 feet deep, from which water was conveyed through six thousand feet of four inch wooden logs. The Providence Water Co. also built two fountains or reservoirs. From these water was supplied to families for ten dollars each.

Water Supply.—Pawtuxet river by direct pumping and pumping to reservoir. The river has a drainage area of 192 square miles and empties into the Providence river, five miles below the city. The Pettaconsett Pumping Station is four miles from the river’s mouth, and at this point water is taken from a basin excavated in the porous and saturated sand near the river bank, there being provision for drainage directly from the river.

Pumping Machinery.—Combined daily capacity thirty-three million (33,000,000) gallons ; 5,000,000 gallons Worthington ; 9,000,000 and 5,000,000 gallons Corliss ; 9,000,000 gallons Cornish, and 5,000,000 gallons Nagle pumping engines.

Reservoirs.—Two ; combined capacity one hundred and twenty-five million (125,000,000) gallons. The Sockanosset reservoir is 180 feet above the pumping station ; has a water surface of 11 acres and a capacity of 50,000,000 gallons. It is an excavation and embankment, the slopes being lined with six inches of broken stone, upon which is laid a 15 inch dry stone wall. The Hope high service reservoir is $162\frac{1}{2}$ feet above high tide, irregular, about 840 by 950 feet and $24\frac{1}{2}$ feet deep, and has a capacity of 75,000,000 gallons. A new high service reservoir has been built in North Providence. Contractor, J. J. Newman, Providence.

Distribution.—Mains, cast iron, 202 miles. Services, lead. Taps, 13,128. Meters, 7,623. Hydrants, Providence, 1,278.

Consumption.—4,934,915 gallons. Pressure, ordinary, 39 to 73.

Financial.—Cost, \$6,234,672. Debt, \$5,500,000. Interest 5 and 6 per cent. Annual operating expenses, \$69,828. Annual revenue : consumers, \$313,561 ; city, \$37,020.

Management.—Board of Public Works.

RIVER POINT.—River Point Fire District contracted with the Pawtuxet Valley Water Co. for water supply for general use, and will have six miles of pipe when completed. See data under Phenix.

PHENIX.

Water Works built in 1885-7 by Pawtuxet Valley Water Company. Engineer, H. B. Barton, Centreville. Contractors, Leach & Baldwin, Philadelphia, Pa. The system is being extended to supply River Point.

Water Supply.—Spring Lake Brook by gravity. There is a reservoir of 17 acres.

Distribution.—Mains, cast iron, 6 miles. Services, lead. Pipes and specials furnished by Warren Foundry and Machine Company, Phillipsburg, N. J. Taps, 90. Meters, Crown, number not given. Hydrants, Ludlow, 41. Valves, Ludlow. Pressure, ordinary, 80 pounds.

Financial.—Capital stock, \$100,000. Bonded debt, \$50,000. Interest, 5 per cent. Annual revenue, \$1,230. Hydrant rental, \$30.

Management.—Secretary, Vernum A. Bailey ; Superintendent, Albert F. Hill.

It was designed when it was completed that there would be 11 miles of pipe and 104 hydrants, but in the summer of 1889 the dam at Spring Lake reservoir gave way from an overflow of water, leaving the works worthless.

SOUTH KINGSTOWN.

PEACEDALE.—Water supplied from the Wakefield Water Co.'s Works. See below.

WAKEFIELD.—The Wakefield Water Co. began construction of works July, 1888, to supply Wakefield, Narragansett Pier and Peacedale. Engineer, J. Herbert Shedd, Providence. Contractor for pipe laying, F. B. Durfee, Norwich, Conn.

Water Supply.—Water bearing gravel, near Saugatuck river, Peacedale, by pumping to stand-pipe 190 feet above tide-level. The area to be supplied is generally from 10 to 60, and at extreme points 130 feet above tide-level.

Financial.—Estimated cost, \$133,000.

Management.—President, Richard Pancoast, No. 68 Wall street, New York city.

Note.—The above data was said in a letter from the president of the company to be somewhat inaccurate in minor details, but no corrections have yet been given.

NARRAGANSETT PIER.—Water supplied for general use by the Wakefield Water Works Co. About one-third of the population is supplied.

WESTERLY.

Works built in 1886 by the Westerly Water Works Co. Designing Engineer, J. Herbert Shedd, Providence. Constructing Engineer, William Brown, Jr. Contractors, Adam Miller & Co., Saratoga, N. Y., and F. A. Snow, Providence; for masonry, Henry Champlain, and for buildings, Randolph, Bently & Co., both of Westerly.

Water Supply.—Shunoe Brook, pumping to stand-pipe.

Pumping Machinery.—Two Babcock & Wilcox boilers; two Worthington compound condensing pumps, daily capacity, 750,000 gallons each. Stand-pipe made by Robinson Boiler Works, Boston, 30 feet in diameter and 70 feet high.

Distribution.—Mains, cast iron, 14 miles. Services, lead. Pipe furnished by McNeal Pipe and Foundry Co., Burlington, N. J., M. J. Drummond, New York city, and Gloucester Iron Works—offices, Philadelphia, Penn. Taps, 180. Meters, 85. Hydrants, Chapman, Ludlow. Chapman and Ludlow valves.

Consumption.—125,000 gallons. Pressure, ordinary, 85 pounds; fire, 90 pounds.

Financial.—Cost, \$125,000. Bonded debt, \$100,000. Interest, 5 per cent. No further financial data given.

Management.—President, 1888, James M. Pendleton. Treasurer, Charles Perry, Jr. Superintendent, Everett Barnes.

WOONSOCKET.

History.—Built in 1884—now owned by city. Engineer, J. W. Ellis. Contractor, John W. Rutherford, New York city; for build-ings, William Hubbard, Woonsocket.

Water Supply.—Crook Falls Brook, pumping to tank.

Pumping Machinery.—Worthington compound duplex directing acting pump, daily capacity, 1,500,000 gallons. Tank made by Cunningham Iron Works, Boston; 50 feet in diameter and 30 feet high.

Distribution.—Mains, cast iron, 21.85 miles. Services, lead. Pipe and specials furnished by R. D. Wood & Co., Philadelphia, Pa., Pan-coast & Rogers, New York city, and McNeal Pipe and Foundry Co., Burlington, N. J. Taps, 761. Meters, 674. Hydrants, Chapman, 334. Valves, Chapman.

Consumption.—269,648 gallons. Pressure, ordinary, 100 pounds; fire, 100 pounds.

Financial.—Cost, \$319,871. Debt, \$300,000. Interest, 4 per cent. Annual operating expenses, \$7,346. Annual revenue: consumers, \$10,940; city, \$10,263.

Management.—Superintendent, Willard Kent.

BURRILLVILLE.

Proposed System.—The Burrillville Water Co. propose to take water from Wallum pond, by gravity, and have made surveys for this and one other plan. The town has voted twice on the ques-tion, once rejecting the proposition, and later, postponing action. The National Water Works syndicate, No. 70 Kilby street, Boston, Mass., are interested.

APPENDIX B.

REPORT

UPON THE

SANITARY CONDITION OF WATCH HILL, R. I.

WITH SUGGESTIONS FOR IMPROVEMENTS.

W. P. Anderson, Esq., President Watch Hill, (R. I.) Improvement Association :

DEAR SIR :—Having, at your request, and upon suggestion of Dr. Charles H. Fisher, Secretary of the State Board of Health of Rhode Island, on September 13th, visited Watch Hill and made a general sanitary inspection of the locality and of the principal hotels, I beg to submit the following report :

PRESENT CONDITION.

Situated at the extreme southwestern point of the State of Rhode Island, on a narrow peninsula, surrounded almost entirely by water, Watch Hill would seem to offer, by its select position, peculiar advantages as a watering place and seaside health resort. Bounded on the east by the open Atlantic Ocean, and by the waters of the quiet Little Narragansett Bay on the opposite side, exposed to invigorating sea breezes, from whatever direction the wind may blow, this beautiful spot appears to be particularly favored by nature to be a fit resting place for tired brain workers, and for all persons in search of health and healthful surroundings.

The place at present consists of a few village dwellings and stores, a number of large summer hotels, some of which are situated on the bluffs, from which magnificent ocean views may be obtained, and of a large and rapidly increasing number of isolated summer cottages, scattered here and there on the undulating grounds, formerly known as "Everett Farm," and now subdivided into many building lots.

The large hotels at Watch Hill are the Ocean House, Watch Hill House, and the Larkin House, on the ocean side, and the Atlantic, Narragansett and Plympton Houses on the bay side.

There is no system of sewerage at present at Watch Hill, nor is there a public water supply. Each individual cottage and each hotel has its own supply of water, derived from storage of rain-water in cisterns or else from wells and springs. Each building takes care, in a more or less perfect manner, of its liquid and semi-liquid refuse. All cottages and hotels have more or less of the usual inside house plumbing. As a rule, each cottage has its own water-tight and cemented cesspool, but to avoid the annoyance of frequent emptying or pumping out, I am informed that many cesspools are provided with overflows, allowing the surplus liquid waters to soak away into the ground, while the solids and grease are retained in the cesspool, which is emptied each fall at or after the close of the season.

As regards the hotels, the Ocean House has a well arranged and well taken care of system of flushing-rim hopper water closets, with abundance of flushing water, and the sewage is carried by drains into a large cesspool, situated between the hotel and the East beach, at the foot of the bluff on which the Ocean House stands. The Watch Hill Hotel has a system of trough water-closets emptying into sewer pipe, carried across the main road into a cesspool near the East Beach. The Annex to the Watch Hill House has only privy vaults. The large Larkin House has several two story or tower privy vaults, and no water-closets. The Atlantic House has a similar arrangement, while the Plympton House has a well arranged and well taken care of system of flushing-rim hopper-closets, flushed from flushing cisterns, delivering into an 8-inch sewer, receiving also the wastes from the Plympton Annex, and carried from the hotel into Little Narragansett or Pawcatuck Bay, where the outlet discharges, at a distance of about two hundred feet from the shore, into deep water, the mouth of the sewer being situated somewhat below low tide level, so as to be at all times covered by water. The smaller Narragansett House, has a system of inoffensive and well kept ash or earth closets.

Many of the privy vaults inspected were found to be in an extremely unsanitary and disgusting condition. Cesspools are becoming rapidly filled, and as soon as one commences to clog up with grease and filth and to overflow, the cesspool is abandoned, a new hole dug close by the first one, and thus the soil is gradually honeycombed and increasing polluted by such a series of foul cesspools. In some cases laundry wastes or kitchen liquids are carried in the most primitive manner, sometimes along or across the roadside, in soak holes in the ground, causing an open nuisance, when the soakage ceases, owing to obstructions. During the inspection several large, highly offensive pools of liquid filth were detected in the immediate vicinity of the hotel windows.

DANGERS TO BE AVOIDED.

It is a well-established axiom of sanitary science that the storage of putrefiable or putrefying filth of whatever character in the immediate neighborhood of human habitations should be avoided; and while this applies to the smallest single habitations or isolated cottages, it is particularly applicable to summer hotels, where a large number of people congregate annually for pleasure or health. With only a few exceptions I find that this law is violated at Watch Hill, and the fact that this resort has so far enjoyed an immunity from infectious disease must be explained to a large extent by the above mentioned exceptional natural advantages of the place. It should be remembered, however, that more people will be attracted to the place from year to year, owing to the salubriousness of its climate, and as rapidly as the place is destined to grow, the unsanitary conditions created or maintained by mankind will multiply and become more and more a source of possible danger to health to the increasing number of permanent summer residents. Therefore, bearing in mind the old proverb that "an ounce of prevention is better than a pound of cure," it is none too soon to begin to think seriously of sanitary improvements. Hotel owners in particular, whose success depends almost entirely upon the good sanitary reputation which a place bears, as well as upon the healthfulness of their buildings, should ever remember that every dollar judiciously expended in the interest of the healthfulness of a resort, will soon be returned to them ten or twenty fold.

LEACHING CESSPOOLS AND VAULTS.

Privy vaults, as well as leaching cesspools, are abominations which should no longer be tolerated in any civilized community. All collection and storage of putrefying organic matter, on or under the surface of the ground, should be avoided as constituting an ever present menace to health. Such accumulations of putrefying filth, undergoing constant decomposition and creating poisonous gases, have been well compared to a powder magazine, lacking only a single spark, to become the center of vast destruction through the rapidly multiplying germs of disease when introduced by a single case of illness. With privy vaults and cesspools abounding, the surrounding earth becomes saturated, the air tainted, the general health of persons living in the immediate vicinity, and compelled to breath such air, becomes affected, and the power of resisting infectious disease will be lessened. Again, the drinking water derived from wells or springs will gradually be poisoned, and thus may arise a second and equally potent cause of illness.

Cesspools and vaults are retained in communities only through ignorance or indifference. It is a fundamental principle that all filth incident to human life should be removed thoroughly and immediately, or at least before putrefactive decomposition begins. Likewise should all liquid or solid offal, garbage, or manure from stables, cow barns, hog pens, henneries, or places where animals are slaughtered, be collected and removed by scavengers, and as much of it as possible used by farmers to enrich the land.

No doubt there will be some who will argue in defense of the "leaching cesspool" for seaside resorts, that it is used only during three or four months of the year, and that it consequently has ample time during the remaining period to purify itself. To this it must be replied that even during the short period of four months a leaching cesspool may become highly dangerous by reason of soil pollution and air contamination, particularly in the case of larger hotels. Besides, it is tolerably safe to assert that proper oxidation does not take place except near the surface, and that even where the foul liquids leach away in the sand the solid foul matters and grease will remain in the cesspools and in the pores of the ground, accumulating from year to year.

WATER SUPPLY.

Until a pure and abundant general system of water supply is introduced, all wells and cisterns should be diligently watched and kept

free from all possible surface defilement and underground pollution. Water stored in cisterns is frequently polluted through the overflow pipe connecting the cistern with a cesspool or some drain carrying foul sewage. It is obvious that such a connection is absolutely inadmissible. Rain-water collected in cisterns may be contaminated through various other causes. Much care should be exercised to see that the roofs and gutters are always kept in a clean condition, that no slops are thrown out from windows on to low roofs, draining into cisterns, that no leaky drain passes near the cistern walls, that the latter are carefully built of sound brick laid in cement, and with the inside rendered with Portland cement and preferably provided with a filtering compartment.

ICE BOXES.

Vigilant care should be exercised with regard to the storage of food, particularly of meat and milk, and the wastes from ice boxes or storage boxes should, under no condition whatever, be joined directly to any sewer or drain leading to a cesspool.

DISPOSAL OF EXCRETA.

As to the disposal of human excreta, one of two rules well established by experience may be followed, namely, either to adopt some so-called dry method of disposal, by which the excreta are kept perfectly and absolutely dry, and by admixture of loam, rich garden earth or ashes, converted into manure to be used on the land, or else to remove the same rapidly by means of plenty of water through a system of water-closets and tight sewers, discharging either into some large body of water, or else delivering the sewage in a diluted condition on to the land to be used as a fertilizer.

THE REMEDY PROPOSED FOR WATCH HILL.

After these general considerations, it is proper to give somewhat more specific advice relating to the problem on hand. There is very little doubt in my mind that with the growth of Watch Hill, nothing short of a complete and comprehensive sewerage system will satisfy the sanitary needs of the place. Other watering-places, for instance Nahant, Mass.; Bar Harbor, Maine; Long Branch and Atlantic City on the Jersey coast, have adopted and carried out complete sewerage systems. The system most fully adapted to the needs of the place

would, in my judgment, be the separate system, dealing only with the sewage proper, while excluding all rain fall, and therefore requiring comparatively small sizes of sewers. Neither the Pawcatuck Bay nor the water in front of the principal bathing beach would be suitable places for the main sewer outlet. It seems, therefore, probable that in the future a main sewer would have to be carried along the narrow edge of land stretching out to Napatree Point, where the sewage delivered either by gravity or by a system of pumping could be discharged into the sea, and probably would be carried away forever by the tides, winds, and strong currents. But the construction of such a comprehensive system would require a comparatively large outlay of money, which for many years to come would be unnecessary.

I shall, in the following, avoid suggesting any too extremely radical method of improvement. The key-note of my advice may be expressed in very few words: for the privy vault and manure pit substitute some dry conservancy system, such as the earth or ash closet, or else some movable-pail system, with frequent removal; for the leaching cesspool substitute either a tight cesspool, to be frequently emptied, or, better, a water-tight sewer, removing all liquid waste organic matter, and discharging it in a fresh, unputrified condition into the deep water of the ocean or bay, or else use—in the case of the isolated summer cottages and residences—flush-tanks, with sub-surface sewage irrigation, leaving to the bacteria, which have aptly been designated as nature's scavengers, and to the roots of plants, the task of the complete destruction of the hurtful elements of sewage, and their conversion into useful elements suitable for nourishment of growing crops, or grass, or shrubs.

DRAINAGE OF THE HOTELS.

Leaving aside, for the present, the question whether the hotels should have dry earth or ash closets, or else a system of well arranged, well flushed, and well taken care of water closets, it is obvious that each hotel will require a sewer for the removal of the slop water, of kitchen and laundry wastes, wastes from bath tubs, etc. The topography of the place being such as to admit in nearly every case of good falls being obtainable, no large sewers are necessary; and a 6-inch sewer, laid in a well graded trench, with well made joints, perfect alignment, and a bore as smooth and true as that of a gun-barrel, will be amply sufficient for the largest size hotel, even when water-closets are used. The best material for such sewers would be salt-

glazed, hardburnt, vitrified pipe, the joints being made with Portland cement mortar. The outlet pipe, leading into the water, should be constructed of heavy cast-iron pipe, well protected against corrosion, by tarring.

Only one of the hotels is now *removing* all its sewage by means of such a pipe sewer, discharging into Pawcatuck Bay. I have closely watched the water near this sewer outlet, and have been unable to find any floating sewage matter, nor was there apparent any defilement of the shore from stranded sewage particles or paper, and although the bay is extensively used during the summer season as an anchoring ground for all kind of pleasure boats, I am told that no complaint has ever been made of any nuisance created by this sewage discharge. This may partly be explained by the well-known fact that sewage discharged in a *fresh* condition is quickly consumed by fishes, animalculæ, and forms of aquatic life, and partly by the fact that where sewage mixes with salt water heavy matters are precipitated to the bottom. Putrid sewage, on the contrary, when discharged into water-courses, will drive fish away; hence it is apparent that one of the cardinal principles to be observed should be the quick removal of all sewage before decomposition sets in.

While I believe that it would be injudicious, in case Watch Hill should be completely sewered, to locate the sewer outlet into Pawcatuck Bay, I can see, for the present, no serious objection to the discharge of the sewage from single hotels or cottages into the large volume of water in this bay. The Narraganset House should have a sewer delivering into Pawcatuck Bay. The cottages situated on the shore of the bay at Foster's Cove, could dispose thus of all their water-borne filth in an efficient and innocuous manner. The Atlantic House, where a deplorable lack of cleanliness in the disposal of waste matter was painfully apparent, should construct a sewer, delivering into the bay under low water, the sewer being carried out as far as the head of the steamboat pier. An upward continuation of this sewer could take care of the Watch Hill House, in which case the cost of the sewer could be divided in proportion; and this same plan could be followed at the Ocean House, the sewer from which could join the sewer from the Plympton House. The Larkin House could also run its sewage by an independent sewer of somewhat greater length, to the head of the steamboat pier in the bay. When, in the future, it should become desirable or necessary to construct the above-mentioned intercepting sewer or pumping-main, these sewers from the hotels could still be made to do service by joining the main

sewer at the foot of each street leading to the bay. Under no circumstances whatever, should any drain or sewer be carried to the bathing beach, which should be kept scrupulously clean and unpolluted. For this reason, I should consider it unsafe to carry the sewage from the Larkin House to the head of the great ocean pier near the promontory on which stand the Life-saving Station and the Watch Hill Light House.

As an alternative method, applicable to the three hotels overlooking the ocean westward, namely, the Ocean House, the Watch Hill and Annex, and the Larkin House, I would suggest the discharge of their sewage eastward, directly into the Atlantic Ocean. There is some doubt in my mind, as to the possibility of the sewer outlets becoming choked by sand and gravel, washed into the pipes by the force of the breakers; but this could probably be overcome by carrying the mouth far out into deep water, and by the use of a flush-tank, as I shall describe presently. The iron pipe itself should be well laid, and strongly and suitably protected, by stone-work, against the strong blows of the waves. It may become advisable to construct the iron outlet sewer in sections bolted together by flanges, and to remove the pipe at the end of each season.

If such a method of disposal of the sewage were adopted, I should advise, for each hotel, the construction of a large flush-tank, built of hard-burnt brick, with cement mortar, and made absolutely water-tight. Between the house and the flush-tank, I should advise arranging a well-covered intercepting or straining chamber, with brick side walls and rounded concrete bottom, and with inlet and outlet pipes level with the bottom of the chamber, so as to avoid absolutely any stagnation of sewage in the straining chamber. This chamber to be provided with one or two rows of upright iron bar strainers, put closely together (one wide and one narrow strainer) for the interception of all coarse solid substances, such as paper, napkins, rags, corks, soap, etc., which should be scooped out and removed daily, and either dried and destroyed by fire, or else composted with garden earth, charcoal, and ashes, and carted away onto the land, to be used as a fertilizer. The amount of such intercepted matter, if removed daily, would be comparatively small, and, with a little care in management, could readily be dealt with without creating any nuisance. By arranging such a straining chamber, the possibility of a defilement of the beautiful East Beach by solid sewage matters returned to the shore, would be entirely avoided. This beach, although not much used for bathing, being composed of fine sand,

is a favorite place for pleasure strolls, and, being one of the attractions of Watch Hill, every effort should be made to keep it unpoluted.

For this reason, too, I suggest the use of a flush-tank, in which the hotel sewage may be retained daily until the commencement of the outgoing tide. Once, or, if necessary, twice a day, at this time, the flush-tank should be emptied, and thus its contents discharged with great force into the ocean. The rush of water will tend to keep the sewer outlet free and unobstructed, and the outgoing ebb tide will carry all liquid sewage far away to sea. Flush-tanks are often provided with automatic appliances, called siphons, to empty the tanks as soon as they become full. In this case, I advise the much simpler plan of placing on the discharge-pipe, where it leaves the flush tank, a shut-off gate-valve, accessible through a man-hole, and to be operated by hand. The hotel manager should make it the duty of some trusted employé to empty this tank twice a day at regular intervals, corresponding to the hours of the beginning ebb tide. The flush-tank should receive not only the waste flow from urinals and water-closets, but also all chamber slops, bath wastes, and all fouled water from the kitchen and laundry. It should be provided with an overflow pipe, to prevent the tank from overflowing in case the opening of the gate-valve should, through negligence, be forgotten. The tank should be arched over, covered, and provided with inspection manholes, carried to the surface. Inasmuch as the sewage is stored in it for no great length of time, I do not consider it necessary, nor even desirable, to ventilate the flush-tank, but, at the end of each season, it should be thoroughly cleaned, the walls washed and disinfected, and the pipes leading to and from it thoroughly cleaned, and all obstructions removed.

DRAINAGE OF THE COTTAGES.

There are a few cottages adjoining the hotels which, in case the latter construct a sewer leading into deep water, could do away entirely with the present cesspools, by joining the hotel sewer and bearing a part of the expense of its construction. A few others, located on the shore of the bay, can easily drain directly into the same.

By far the greater number of cottages, however, are isolated and scattered about, and for the present, at least, a common sewer would seem to be out of the question. A local treatment of the house sewage becomes, in such cases, a necessity. The present method of tight

cesspools with overflows, allowing the sewage to soak into the ground is, to say the least, crude and imperfect, and is accompanied with some danger wherever the domestic water supply is derived from a well. Although the wells are lined with cement pipes, to keep out any surface water, or soakage from the strata which the well pierces, yet none of the wells are very deep—water said to be of good quality, being generally obtained at a depth varying from fifteen to twenty-five feet. There is, however, absolutely no security against the soakage of sewage into the ground, and it would be obviously dangerous to trust to the filtering power of the deeper strata of earth to purify the sewage before it reaches the underground sheet of water from which the well draws its supply. It is well known and a well established fact that the upper layers of earth, the *sub-surface* to a depth of one or two feet, are pre-eminently fit, owing to the oxygen contained in the pores of the soil, to oxygenize and render innocuous sewage matters delivered into the same. In this purifying process the ground is assisted during the summer season by the action of vegetation, and furthermore by the action of the bacteria contained in the upper layers of the soil. Hence it is much preferable to keep all sewage on the surface or just under the surface, and this can be done with success in several ways.

In the case of small cottage lots the only safe method is to build absolutely tight cesspools. I should construct these cesspools not in the usual way, but with two chambers, the first and smaller one to act as a retaining chamber for solids and grease, while the second and larger one is to receive, by means of an overflow, dipping well down below the water level of the first chamber, only the liquid sewage. Much of the latter can be pumped out at intervals and used to water the lawn or flower beds, and the first chamber should be frequently emptied, at night, and the contents mixed with charcoal, gypsum, and ashes, and dug into the ground. All flow of rain or surface water into the cesspool should be avoided. Another scheme applicable to larger lots, would be to carry from the liquid chamber a number of outlet pipes all placed on the same level, distributing the sewage close under the surface of the ground, but under no circumstances should an overflow be taken from any sewage cesspool to the beach.

Where plenty of land is available around a cottage, and where the soil is of a suitable character, excellent results may be obtained by using the sub-surface sewage irrigation system, which consists essentially of a small flush tank, having a capacity equal to the daily sew-

age of the house and a net work of open jointed, small agricultural drain tiles, laid only a few inches below the surface of the ground, preferably under grass land or a lawn. The flush-tank discharges as soon as it is full automatically and intermittently—usually by means of some form of automatic siphon—and sufficient time is thus given between consecutive discharges for the soaking away of the liquid sewage, the ground acting as strainer, and the oxygen contained in the pores of the soil acting as a destroyer of all organic matter attaching to the particles of the soil. A quick intermittent discharge from such a flush-tank is obviously much to be preferred to the slow and irregular oozing out through a number of overflow pipes.

It seems to me that many of the present cottages have sufficient ground about them to adopt the system of sub-surface irrigation recommended, and a trial of this method, which, in many country places without sewers, has given good results, would seem to me to be worth while.*

In all cases, I should advise the discontinuance of the use of well-water for drinking purposes, except where the well can be put at least one hundred feet away from the sewage field. Rain-water, stored in perfectly tight and well-kept cisterns, can be made very palatable by filtration, or by boiling and subsequent aëration and cooling with ice. I would strongly urge the consideration of introducing and distributing water to all hotels and cottages, under pressure, at an early day. As the place grows, the need of such a public water supply will become more apparent from season to season.

INTERIOR SANITARY ARRANGEMENTS OF THE HOTELS AND COTTAGES.

Apart from the liquid refuse of slop water, which are most easily disposed of by sewers, two methods may be adopted in dealing with the excreta from the houses and the hotels. One system applies the deodorizing and absorbent power of dry earth or of ashes, while the other uses water as the vehicle for the removal of fecal matter. In one case, the receptacles for removing filth are earth or ash closets, or tubs or pails; in the other case, the receptacle used is the water-closet. The first method necessitates a temporary retention and storage of fecal matters on the premises, while in the second, these latter

* The question of the "*Disposal of Sewage from Isolated Country Houses*" is discussed by the writer at greater length in a paper, which will be found in Appendix C. in this Report.

are immediately and completely removed through well constructed, well-flushed, and amply ventilated underground pipe channels. Of the two methods, the removal by water carriage is certainly the better, cleaner, and more efficient.

The advantages of the earth-closet are, briefly, that its first cost is less; that the quantity of water used in the house is much reduced; that the closet, itself, is not so liable to get out of order as many forms of water closets; that stoppages, from improperly introduced substances, will cause less damage, and that there is less danger of injury to the apparatus by frost. Finally, the manurial value of the excreta and urine are saved, and the dry-earth manure may readily be stored (at some distance from habitations) until needed on the land. On the other hand, the earth closet is undoubtedly inferior in point of cleanliness and appearance to a well kept and well flushed water-closet. It is also less free from objectionable odors. The use of the dry earth system on a large scale, especially in two-story closet structures as required by the hotels, is attended with some difficulty. A large quantity of suitable dry earth or loam is required. The method of throwing earth by a scoop to cover the deposits, is hardly sufficient and reliable in the case of hotels, and more or less complicated mechanical arrangements for distributing the earth, to enable each user of the closet to cover the excreta at once, must be provided; and these, although obtainable in the market, may prove, in the end, almost as difficult and troublesome to take care of, as a simple flushing-rim hopper water-closet. The collection and removal of the earth boxes or pails must be attended to with regularity and frequency; and thus the management of such dry systems may also prove an obstacle in the case of the larger hotels.

Taken as a whole, I believe that ultimately all hotels should be fitted up with a system of interior plumbing and water-closets. Two of the hotels have already taken the lead in this respect, and while it would be unreasonable to expect to find at summer hotels, where the season is only short, all the refinements of plumbing work, such as are becoming more usual in the larger cities, the leading principles of safe sanitary house drainage should be observed in the construction and arrangement of the water-closets, sinks, bath tubs, and wash basins.

The amount of plumbing work in the hotels should, preferably, be as small as possible, and all the sanitary arrangements should be of the most simple yet efficient character. Plumbing fixtures should be confined to the water-closets and urinals, the slop-sinks, possibly a

few bath-rooms, the kitchen, scullery, pantry, and laundry. No plumbing fixtures should be put in bed rooms under any consideration. But wherever sinks or basins are placed, with waste-pipes and traps, the pipes should have the fullest possible ventilation up through the main roof, and the traps should be rendered safe against siphonage or back-pressure, and this applies particularly to the kitchen and laundry department of hotels, where, as a rule, the plumbing work is found to be in a more neglected state than in the apartments accessible to the hotel guests.

As regards the proper arrangement of plumbing work, of the drains, waste-pipes, traps, and fixtures, in the hotels as well as in the cottages, I may be permitted to refer to a Report on "House Drainage and Sanitary Plumbing," prepared by me for, and published in, the Fourth Annual Report of the Rhode Island State Board of Health for the year 1881.*

In concluding this report, I would say that it is safe to assume that, at least in some cases, defective sanitary conditions may be attributed not to indifference or carelessness of owners, but to the existing doubts as to which course to pursue or what remedy to adopt. It is a frequent experience elsewhere, that where a feasible, practical, inexpensive, and not too radical remedy is suggested, hotel keepers, as a rule, are quite ready and even anxious to adopt the suggestions and to introduce sanitary improvements. The earnest desire of some of the Watch Hill hotel keepers to have their sanitary arrangements perfect, was apparent to me during my visit of inspection.

Each succeeding year will undoubtedly bring more attention to the details of sanitary construction. Meanwhile, let all hotel keepers bear in mind that it is their sacred duty to provide for their guests a pure and wholesome water supply, good food, pure air, thorough drainage, and neat surroundings free from all soil pollution. Let them spare neither pains nor expense to realize this; let them secure the best expert talent to have their places annually re-inspected, and

*I also refer those who may be anxious for further details, to my books: *House Drainage and Sanitary Plumbing*, 2d edition. D. Van Nostrand Co., 23 Murray St., N. Y. City. *Hints on the Drainage and Sewerage of Dwellings*, 2d edition. Wm. T. Comstock, 23 Warren St., N. Y. City. *A Guide to Sanitary House Inspection*, 2d edition. John Wiley & Sons, 15 Astor Place, N. Y. City. *Recent Practice in the Sanitary Drainage of Buildings*. D. Van Nostrand Co., 23 Murray St., N. Y. City. *Sanitary Questions: A Chapter on the Water Supply, Drainage, Sewerage, Heating, Ventilation, and other sanitary questions, contributed to Cottages, or Hints on Economical Building*. W. T. Comstock, N. Y. City. *The Disposal of Household Wastes: A discussion of the best methods of treatment of the sewage from isolated country houses or Institutions, and of the modes of removal and disposal of solid house refuse, such as garbage and ashes*.

when the more palpable defects are pointed out, let them engage good mechanics to obtain the best possible workmanship in the putting in order of their sanitary arrangements.

It is believed that a simple and readily carried out remedy for the present unsanitary conditions, is outlined in my report. Should it not be sufficiently definite in any of its suggestions, I shall be glad to offer such further advice as I may be able, through many years' experience with sanitary works, to offer.

Respectfully submitted,

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39 Union Square, New York City, Sept. 24, 1889.

APPENDIX C.

THE DISPOSAL

OF

SEWAGE OF ISOLATED COUNTRY HOUSES,

BY

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So large a proportion of houses of the better class are scattered about all over the State, and especially just outside of, and at different distances from, the cities and compact villages, and where connections with public sewers are impossible, that plans and suggestions in regard to the drainage of such isolated properties, must be of great interest and value. The paper in Appendix C. will be found to present methods in a practical manner.—(SEC. S. B. II.)

THE DISPOSAL OF SEWAGE

OF

ISOLATED COUNTRY HOUSES.

A serious and all-important problem presents itself to all builders or occupiers of suburban and country residences, not located within reach of sewers. I refer to the question what method should be adopted by architects or householders to get rid of the liquid wastes from the household in a manner calculated to avoid at once all nuisance to sight or smell, all danger to health arising from the pollution of the soil, the water and the air, and all causes of contamination of water courses, whether flowing streams, or ponds, lakes, estuaries and harbors. The problem is not at all a novel one, for nearly two thousand years ago Hippocrates discussed the same subject of the relation existing between health and soil, air and water, yet, if we contemplate, for a moment, the numberless filth-recking and disease breeding privies and barbarous leaching cesspools which we still encounter everywhere, and which apparently are accepted as necessary adjuncts to farm houses, summer residences, mechanics' dwellings, etc., we hope to be considered justified in again calling attention to the evil results of improper methods of sewage disposal, and in discussing briefly the proper remedies.

Let us begin with a consideration of the smaller farm houses, mechanics' cottages and laborers' dwellings. The crude methods usually adopted to get rid of all filth from these are the discharge of the liquids into some open ditch, or into some neighboring water-course, brook or pond, and the accumulation of the excreta in privy-vaults. In other cases, slops are retained on the premises by pouring them directly in front of the kitchen window on to the surface of the ground, which is thus kept continually wet, and quickly becomes saturated with filth, or else the liquid sewage is stored in leaching

cesspools or poured into disused wells. It seems unnecessary to explain at length the disadvantages and dangers of privies, vaults and stagnant pools of slops, from a health point of view. The objections against them are well recognized, and hence such devices are now utterly condemned by all sanitarians as relics of primitive stages of civilization. The proper disposal of the slop-water of such small houses is so easily accomplished, wherever, as is almost always the case, a small vegetable garden, or lawn, or grape vine trellis, or an apple orchard adjoin the house, as to make us wonder why better methods than those indicated above are adopted as yet in comparatively rare instances. In all such cases, the sewage may, with advantage, be used to feed plants and fruit trees, or to irrigate the soil. The ruling principle should be to keep solid and liquid waste matters, as much as possible, apart, for this will facilitate the disposal of both. The kitchen water, soapsuds from washing, chamber slops, urine, and other fouled water, are easily disposed of, by a daily distribution in the garden, either by irrigation, or by subsurface irrigation. The slop-water should be collected every day in a tight tank and carried by hand, or carted in a wheelbarrow, to the garden, and there used to water plants, shrubbery and fruit trees, or to cultivate garden vegetables. Instead of by surface irrigation, the slop-water may be discharged into one or more lines of absorption drains, laid with open joints under the surface. For the smallest cottage, fifty feet of absorption tiles are sufficient, and in proportion, as the quantity of household sewage increases, the amount of tiles should be increased. The principal points of importance are that the sewage be applied to the soil while *fresh*, and before decomposition sets in, that it should be applied in moderate quantities only, to prevent oversaturation of the soil, that the sewage be applied on or near the surface of the soil, within reach of the oxidizing influence of the air and of the bacteria in the soil, and, finally, that the application be made intermittent, so as to give the soil, after each discharge, a chance to breathe, as it were, and to allow the finer solid particles to be oxidized and destroyed. An easy method of accomplishing the disposal of slop-water, where the house contains no plumbing fixtures, is to have near the house a hopper or receiver of wood or rustless iron, or, better, of earthenware, and provided with a strainer and a proper cover. From this a pipe may be carried underground to the absorption tiles, while the house sewage may be carried to and discharged into the hopper by means of a pail, thus sending rapidly a full volume of slops at proper intervals into the absorption tiles.

The solid excrements are taken care of in the case of small cottages quite as readily and inoffensively by adopting an earth or ash closet, in place of the usual privy, still so much *en vogue*, although long ago unanimously condemned by practical sanitarians. In the application of the dry earth system sufficient dried earth, garden loam, or sometimes coal ashes are mixed with the excreta to absorb all foulness, keep down all odor, and prevent putrefaction. Such earth closets work quite satisfactorily with only a little attention, and form a simple and cleanly substitute for the privy nuisance. They are manufactured in various grades, and with more or less complicated mechanism. As a rule, the simpler the arrangement, the better. If placed out of doors, the earth closet should not be located too far away from the house. The outer structure should be strong, substantial, with a good roof to protect it against rain or dampness, well lighted, well ventilated, not too much exposed to the rays of the sun, and preferably plastered on the inside as a protection in cold weather. A carefully kept dry walk should lead to it from the house, and it is better to have the walk and the closet shed screened from view and from the prevailing winds. The excreta should be received in a movable wooden box, well tarred, or else in a galvanized iron pail, not too large, and of such shape and construction that it can easily be carried. The box or pail should fit close up under the seat, and each time the closet is used, ashes or dry earth should be used as deodorizers, being thrown down either by a handscoop or by a mechanical apparatus. There can be scarcely any doubt about the economy, efficiency, and convenience of such apparatus in the case of small houses. The property of dry earth, of not only deodorizing, but also absorbing, and rendering harmless excreta of animals has long been well known. Some difficulty has been experienced in cases where the earth was kept too damp. According to recent observations a much smaller quantity of earth is required for earth closets, if the separation of the liquids and solids is at once effected. This may be accomplished by intercepting the urine under the seat, and removing it by a waste pipe. The closet is thereby more easily kept free from smell, and if properly used and well taken care of, it can be located in an extension of a dwelling without becoming a nuisance. The dry earth manure ought to be removed at frequent intervals, and in summer time used and dug under the soil in the garden attached to the cottage. In winter time it may be dried in out-house and can then be applied over and over again. Ashes are sometimes used in place of earth, or else finely powdered charcoal, which latter is a well known deodorizer.

The latter can be applied with a mechanism similar to the one used in earth closets, and it is claimed that only about one-fourth the quantity will be needed. As charcoal is rather expensive this is an important consideration. Some also claim that removal need not be so frequent in the case of charcoal closets, but this is, at best, a doubtful advantage.

In cottages, or suburban residences of somewhat more pretension, the earth closet is sometimes located, for conveniences sake, in an extension of the cottage, and it then usually becomes desirable to have also a somewhat more convenient method of disposal of the slop-water, which would avoid exposure of the housewife or servant to the inclemencies of the weather. This may be secured by arranging a properly ventilated and trapped waste-pipe—a pipe two inches diameter is plenty large enough—to carry the waste from the kitchen sink, the laundry tub, and wherever this is provided for, from the bathtub, into a small receiving tank, located outside of the house, and placed below the depth to which frost usually penetrates. This tank may be a plain wooden box, or an earthen or iron tank, or finally a tank built of brickwork. It may be emptied in the plainest kind of an arrangement by hand, or else it may be discharged by an automatic device, such as a siphon, a tumbler tank, or other mechanical appliance. It may become useful, even in the case of small houses, to build some sort of a grease trap to prevent the grease from being discharged and finally clogging the small absorption pipes. It is, of course, assumed that the general topography of the lot is favorable to such an arrangement, in other words, that there is not a slope from the garden, or absorption field, toward the house, in which case disposal by gravity becomes impossible. If the earth closet is placed inside of a dwelling the same precautions should be observed which are taken in the case of water-closets. The ventilation of the apartment is an important matter, and should receive careful attention. As a rule, it is better to locate an earth closet in an isolated or detached part of the cottage. While an earth closet is inferior to the best water-closet, I have no hesitation in pronouncing it, if well taken care of, superior to many water-closets *as usually arranged and kept*.

The question whether a farm house or laborer's small cottage should be provided at all with plumbing work, and above all, whether it is wise to have a water-closet indoors, which in turn requires a more or less complicated system of service pipes and a service cistern, is, more than anything else, one of convenience and comfort. The annoyance and cost of frequent repairs, and the difficulty in country districts of

getting a mechanic to fix such apparatus when out of order, the danger of exposed pipes and traps freezing in mid-winter, or sometimes the lack of an abundance of water for flushing, or the necessity of raising it by hand-pumping,—all these are considerations which may deter many from putting any plumbing work into their homes. It is undoubtedly much easier and less troublesome to deal with the sewage problem of cottages, if the strict separation of solids and liquids is adhered to. A water-closet in a house not only requires a larger discharge pipe than the two inch waste pipe for slop-water, but it complicates at once the whole arrangement. That it can be made quite safe, perfectly inodorous and inoffensive it is not necessary for me here to assert. Those who have followed the recent improvements in house drainage and plumbing work will know that it is possible to select a good water-closet and fit it up in such a way as to be in all respects satisfactory. In points of cleanliness, I think it certainly stands ahead of any other device. Its advantages are many, but its disadvantages under certain conditions ought not to be overlooked. If a water-closet is used in a cottage, the solids should not enter the outside tank for slop-water, for they would soon clog the siphon or the absorption tiles, but they should be intercepted in a settling chamber and frequently removed. How this may be done will be explained later on when detailed reference is made to larger country houses.

The proper disposal of the sewage of larger country or suburban residences, fitted up with all the usual plumbing appliances, is often, indeed in most cases, a much more puzzling problem. What shall be done with the more or less large daily volume of sewage of detached and isolated country houses, without creating a nuisance either on one's own premises or on those of the neighbors? This is a question of much interest to thousands of householders who live in the better class of country or suburban houses, and who are often compelled to meet the difficulties as best they can. The problem has long engaged the attention of civil engineers, who make a specialty of sanitary drainage, and while it is possible that the best solution has not yet been discovered, there are several methods which are in more or less successful use. Whatever method of disposal of the sewage may be adopted, it is obvious that one must decide about it before arranging the house drainage system inside of a house, for the best arrangement of the main drain and its branches in the cellar or basement of a house will depend upon the direction in which the sewage tank will be erected, or upon the location of the final outlet. Generally speak-

ing, an isolated country house, not in reach of sewers, may dispose of its sewage by one or the other of the following methods :

1. It may discharge its sewage into an open surface ditch or gutter, removing everything from the house, and carrying the wastes into a more or less distant sink hole, or to some low spot where the sewage is allowed to soak away and to evaporate slowly. This method, based on the principal of "out of sight, out of mind," is a very primitive one, and one that has not a single feature of merit. As a rule, such a system becomes highly offensive to the immediate vicinity of the house.

2. The house drain may empty the sewage into a large open or leaching cesspool, allowing the liquids to ooze away through underground porous strata, or by fissures and cracks in the rock. This, although a very common method of disposal; is in reality one very dangerous to health, particularly so where the water supply is local, being derived from a well, a cistern or spring on the premises. It is a method utterly to be condemned as both unsafe and nasty.

The most primitive form of cesspool is a hole dug in the ground, into which all the sewage is continually poured, the result expected being that at least the liquid will soak away through unknown underground recesses, and disappear. Occasionally the sides of such a cesspool are lined with loose stones, laid dry, the liquid sewage escaping at the numerous open joints into the surrounding soil, while more or less of the solid matter and grease are retained in the cesspool, undergoing at once a very dangerous process of decomposition; in the presence of moisture, heat and darkness—all conditions known to be particularly favorable to the growth of dangerous bacteria or germs of disease. In dealing with sewage, a cardinal principle, always to be observed, is to avoid all stagnation. In the leaching cesspool we have the worst possible example of stagnation and of accumulation of putrefying filth on our premises. The great objection to a leaching cesspool is not only that it constitutes in itself an abominable nuisance, comparable to a powder magazine, which merely needs a single spark to create destruction, but that it unavoidably and invariably pollutes the subsoil in the neighborhood of dwellings, contaminates the water supply, and renders the air which we breathe obnoxious by its exhalations. If we consider for a moment that such isolated country dwellings and farm houses, which are not in reach of sewers, also do not usually enjoy the benefit of a public water supply, but must derive their potable water from wells, cisterns or springs on the premises, the full extent of the evil and the force of our objections become

more apparent. It is, indeed, of the utmost importance that the local water supply of isolated dwellings be kept as clear and free from contamination as possible ; but even supposing that water is introduced from a street or public supply, the enormous evils of soil pollution and air contamination remain. Two thousand years ago, an old philosopher, Hippocrates, preached a sanitary formula, which has not been improved up to the present day. Recognizing the dangers to health resulting from neglect of sanitary precautions, he expressed his advice in the words, "pure air, pure water, and a pure soil." What, then, shall we say if some of our best architects of the present day persist in suggesting as the most convenient and ready means of getting rid of the sewage of a country house the adoption of a leaching cesspool?

I admit that in sparsely populated country districts a leaching cesspool, located at a great distance from, and at a lower level than, the house, may sometimes be used without causing any harm to the occupants of the house. As a matter of principle, however, sanitary science must condemn such devices in every case. If the principle is true that we should speedily return all organic dirt and filth to the earth, it should be carried out in such a manner that the soil may accomplish the complete destruction of organic filth. We shall see, further on, that this can be done only near the surface of the soil, and by application of the sewage before it becomes putrid.

In pouring our sewage into leaching cesspools, on the contrary, we bury all matter deep in the ground, remote from the cleansing, oxidizing effect of the atmosphere, of the purifying action of plant life, and of the help which is rendered by some of the low organisms, or so-called bacteria, in the process of nitrification and destruction of organic matter.

Then, again, another important consideration should not be lost sight of, namely, that often where a leaching cesspool cannot work any danger to our own house, our own well or spring, it may pollute shallow or deep wells belonging to adjoining estates. It is, therefore, evident that as habitations are grouped closely together, leaching cesspools become more and more inadmissible. If we are selfish enough to locate such a cesspool in the remotest and lowest corner of our own garden, entirely forgetful of its immediate proximity to our neighbor's drinking-water well, it is but perfectly proper that our health authorities should remind us that we have some obligations to fulfill against our neighbors.

Occasionally, such cesspools are built with the sides solid, leaving

only the bottom loose for the escape of sewage, or in cases where they are originally open on the sides, the pores soon clog, and the removal of the liquid then takes place in a very imperfect manner.

3. The house drain may deliver the sewage into a tightly built cesspool, provided with an overflow pipe carried into some ditch or watercourse. Such an arrangement may be considered a direct outcome of the leaching cesspool. Desiring to avoid the pollution of the soil, the architect or owner built the cesspool with tight sides and bottom, but, finding that it would rapidly fill up, and that frequent pumping out would be expensive, an overflow was taken from the cesspool, and the surplus of liquid sewage carried away. While such a tight cesspool with overflow located far away from the house, and with the overflow carried into some large volume of rapidly flowing water, may be unobjectionable, where but little water is used in a house, the arrangement constitutes in the case of larger houses a fearful nuisance, for the sewage is already putrid when removed.

4. The alternative is to empty the sewage into a cesspool built absolutely tight, and without overflow. Such a cesspool avoids the pollution of the water supply, and also the contamination of the subsoil. It is, therefore, an arrangement much to be preferred to a leaching cesspool, and permissible under certain circumstances. Perhaps I should rather call it a sometimes necessary evil, for it should be borne in mind that it involves a long temporary storage, and does not effect an immediate or nearly immediate disposal. Hence it cannot be approved from a sanitary point of view, and its objections are many and serious ones. Since it is the object of all good drainage to get rid of filth from the premises at once, or else to dispose of it on the premises while *fresh*, so as to be completely taken up by vegetation and purified by the soil, it is evident that a vast receptacle of accumulated filth cannot be considered a sanitary device. The stagnating sewage within the walls of the cesspool undergoes a process of decomposition, and the gases generated are extremely unwholesome, often causing, by improper escape, or by entrance into houses through the sewer pipes, a nuisance. To ventilate such a cesspool successfully is rather a difficult, and often an impossible, matter.

To overcome some of these objections, it is the habit of some architects to use two cesspools for a single house, delivering into the one all water-closet wastes, while the other one is intended for the reception of kitchen and laundry water. I do not approve of such an arrangement. Practically, it is found that after awhile both cesspools do not differ materially, as regards the degree of putrefaction

and offensiveness of their contents ; nor can I see any sense in duplicating or multiplying the dangers which adhere to all cesspool arrangements.

There are some cases where no good feasible way of dealing with sewage may be advised other than to run it into a tight cesspool. In that case, the following precautions are to be observed : The cesspool should be located as far away from the house as possible, and there should be proper disconnection between the house and the cesspool. The latter should be built in two compartments, the first of which constitutes an intercepting chamber for the solids, while the second and larger chamber will receive the liquids. Both chambers should be built thoroughly tight, of hard-burned brick, laid in hydraulic cement, preferably of a circular shape, and the walls should be well rendered inside and outside with Portland cement. Each chamber should be arched over and topped with a manhole, covered with a tight iron cover. The cesspool should be as well ventilated as it is possible to do, and it should be emptied, cleaned and disinfected at frequent intervals. The separation of the liquid from the solid matter facilitates much the disposal of both. The liquids may be bailed, or better, pumped out, and used to sprinkle and irrigate the lawn, or kitchen garden, shrubbery, vine trellis or apple orchard. The solids should be removed and dug as fertilizers under the soil. The oftener this is done the better, and the less offense will be caused by the application of sewage to land.

Some objections to a cesspool always remain. If it is built, as it should be, *absolutely* tight, and of moderate size only, to avoid the retention of too large a volume of sewage, then the necessity of frequent pumping arises, and with it the annoyance of constant attention and of manual labor. If we enlarge the dimensions of the cesspool to avoid the frequency of pumping out, we increase the dangers always resulting from stagnant sewage, and create, as it were, a large gasometer for noxious gases.

5. If a stream of running water, either a brook, river, canal or tidal estuary is available, at not too great a distance, a single house may sometimes discharge its sewage into it, trusting to the dilution of the sewage and to the self-purification of the stream to render the sewage innocuous. This method, simple and convenient as it may appear, cannot be regarded as permissible in all cases. It is a method which, especially if the current is not rapid, and the volume of water in the stream not large, may cause serious annoyance and offense, and hence must be condemned as crude and imperfect ; for,

by pouring the filth into the nearest water course, we simply remove the evil from one place to another, without attempting to abate the nuisance. Again, it should be remembered, that what may be feasible and unobjectionable for a single house, is not practicable in the case of a number of adjoining isolated country houses. The pollution of creeks, rivers and streams must be avoided, especially of those water courses serving as a source of supply of potable water for villages and towns located along the banks of these streams, and from which canal boats or river craft draw their drinking and cooking water. Riparian dwellers always suffer by direct discharge of unpurified sewage into water courses. The watering of cattle, and washing and bathing in the river are thereby often rendered impossible; while more or less damage is done to fish culture, particularly where the sewage is discharged in a putrid condition. While it is a well-known fact that some kinds of fish feed on *fresh* sewage matter, others, particularly salmon and trout, appear to be very delicate, and usually suffer from the pollution of streams.

Channels with tidal flow, finally, should not receive sewage, for much of the solid matter discharged into them will repeatedly float up and down with the ebb and flow of the tide, instead of being at once removed. Offensive odors pervade the air, the banks will become defiled, the river beds silt up, and the channels gradually become obstructed.

6. Houses located at or near the seashore have, sometimes, no other available outlet for the discharge of their sewage than the ocean; but, although at first blush a ready means of getting rid of sewage, such a discharge is seldom permissible. Experience has demonstrated the unpleasant fact that floating sewage matter, discharged into the sea, may return to the shore with the tide, or through the action of eddies, currents, winds and waves. The sandy beaches become polluted, and the damage inflicted may seriously interfere with the use of the beach for bathing or recreation purposes. The direct discharge into the sea is only practicable where the sewage outfall from houses on the cliffs or near the beach is carried far out into deep water, and all sewage matter carried away by some strong currents setting in at right angles to the sewage outfall, or about parallel to the line of the beach.

7. It is obvious, therefore, that in the majority of instances, house sewage cannot be directly admitted into water courses or streams of any kind, nor into the sea, without creating a nuisance to sight, smell, or a danger to health. As far as practicable it should first be purified

by removing the suspended impurities, and at least a part of the matters in solution. The purification may be effected by various methods, such as artificial filtration, chemical treatment, or by the application of sewage to land. After being purified by mechanical or chemical processes, sewage can sometimes be admitted directly into streams, in other cases, however, it becomes desirable that it be further purified or utilized on land.

I shall not stop to consider the question of artificial filter-beds, for, to my knowledge, such a system has never been used in the United States, in connection with the sewage from houses. I desire only to refer to a very ingenious mechanical filter, invented in England, and recently introduced into this country. It is known as the Farquhar-Oldham filter. The chief characteristic of this machine is the revolving cutter, which is so arranged that whenever the surface of the filtering medium clogs up with sewage sludge, it can be removed by said cutter in a few moments, whereby practically a new filter is established. This operation may be repeated as often as found necessary. While I have not personally made use of this filter for purifying the sewage from isolated country houses, I understand that it is in successful use at a country house at Seabright, New Jersey, and elsewhere. Wherever no system of sewage purification by application to land is possible, I believe this method will form a successful solution of the problem, although many will hesitate to adopt it, owing to its cost. The best filtering material for such apparatus is sawdust, which, when removed, can be readily utilized, to fire up the boilers needed for the sewage pumps.

8. Sewage from isolated country houses may be purified on the premises by chemical treatment. By this method the suspended and a part of the dissolved impurities are precipitated by means of chemicals. Quite a large number of chemical processes have been invented, but none of them have attained any very extensive use. One of the most common processes consists in the addition of milk of lime to sewage. Much more effective than this are solutions of sulphate of alumina, or of perchloride of iron. Such chemical precipitation, while not accomplishing a very thorough purification, removes the impurities to such an extent as to permit a discharge into a tidal river or a large stream. Occasionally, however, as stated above, the clarified liquid is applied to land for further rarification.

In selecting a precipitant, preference should be given to one which accomplishes the process of subsidence with rapidity; at the same time it should be remembered, in choosing a precipitant, that it

should produce a sludge of minimum bulk with maximum amount of solid impurities. In both respects, milk of lime is inferior to the other chemicals mentioned above.

A difficulty adhering to all chemical precipitation processes is the disposal of the sewage sludge. It usually contains, after precipitation, from 90 to 95 per cent. of water, and unless the latter is removed it soon decomposes and becomes offensive. It has been suggested to evaporate this water by artificial heat, but such a process is expensive. Others have proposed the separation of the liquid matter from the solid in centrifugal machines. In some instances, sludge is pumped directly from the precipitation tanks to land, where it is left exposed to the air, and when comparatively dry is dug into the ground. In some patented processes, such chemicals are added as enable the manufacture of brick or of cement from the sludge. More recently, powerful filter-presses have been used, which offer great advantages. By means of these the sludge is quickly pressed into cakes, which may be sold as manure to farmers, and not being bulky, enable a better transportation for long distances.

Chemical treatment must sometimes be adopted where land is not available for purification purposes, or where its high price precludes any efforts to obtain an area sufficiently large for irrigation. It may, at times, become necessary to resort to it, where the soil is underlaid with rocks. Again, chemical precipitation may be combined with the application of sewage to land, in which case a much smaller irrigation or filtration area is sufficient. But all this refers more to the sewage from large institutions or from villages or towns.

Chemical treatment is not well adapted to single, isolated dwellings. The process implies the construction of tanks, the provision of suitable chemicals, the careful and thorough mixing of the sewage with the chemicals, all of which calls for considerable expense. Apart from this consideration, such a manipulation of sewage is not desirable on the premises, and in the vicinity of dwelling-houses.

It may be said in general, that whatever the chemical treatment may be, it will be wise not to have too much faith in the realization of a large commercial profit from the sewage treatment. Far better to make the ultimate purification of the sewage the chief end in view. It is also well to remember that in certain chemical processes, the effluent water is of such a character that, if discharged into brooks or rivers, it may kill fish and cause an injury to fish culture. Chloride of lime is particularly objectionable. Sulphurous and hydrochloric acids are also said to be very hurtful.

9. Wherever a sufficient area of land is available, and the layout of the land and the character of the soil are favorable, sewage may be disposed of, and purified on the premises by applying it to the land. Generally speaking, the application of sewage to land forms the best solution of the problem of sewage disposal. Not that it enables us to derive much profit from its utilization—this should always be a secondary consideration, in the case of larger institutions or towns not less than in the case of single houses—but by applying sewage to land it is always possible to effect its purification to such an extent as to avoid the usual fouling of surface or subterranean water courses. While chemical precipitation and mechanical filtration may be considered *artificial* processes, the purification of sewage by the soil is a natural process, completing one of the constant rounds or circulations going on in Nature. The water on the globe furnishes an example of such a circulation going on forever. Arising as a vapor from the ocean, and from large exposed surfaces of flowing water, it is carried along in the upper strata of the atmosphere by currents of air, and forms clouds, from which it is again precipitated upon the surface of the earth in the form of rain, snow, hail, or dew. A part of this storm water is immediately evaporated and returns to the clouds, another part flows off on the surface forming successively springs, brooks, rivers, streams—all flowing toward the great ocean, while a third part soaks into the ground, and is partially absorbed by vegetation, and partly forms underground streams of water with an inclination toward some stream, or else forms springs, which finally come out at the surface.

Another example of a constant round in Nature is afforded by the circulation going on between animal and vegetable life. Plants are nourished, and grow upon decomposed animal matter, effecting a change of those substances which might become dangerous to animal life, into harmless food substances for the roots of plants. The same plants, perhaps, form the nourishment for man and animals, and are again discarded to feed vegetation.

The whole process of water circulation has never been better described than in the words of Mr. F. O. Ward, at the General Congress of Hygiene, at Brussels, in 1856. These words, quoted by Mr. Edwin Chadwick, the nestor of sanitary science in England, in an address on "Circulation or Stagnation," are as follows:

"The water which falls on the hills in a state of purity undergoes a natural process of filtration through sand, enters the rural collecting

pipes, and passing through the aqueduct to the metropolitan distribution pipes, finds its way to every story of every house in the town ; whence again, after having supplied the wants of the inhabitants, it runs off, enriched with fertilizing matter, which it carries away before allowing it time to ferment. This manure, driven along irrigation pipes, is deposited in the soil, leaving the water to pass into drainage pipes, and flow on to the rivers. The rivers conduct it to the ocean, where it rises as vapor under the heat of the sun, to redescend as rain on the hills, enter again the collection pipes, and recommence its vast and useful course of circulation."

But let us return to the consideration of the application of sewage from isolated country houses to land. The conditions of successful application are a sufficiently large area of suitable, absorbent, well aerated, properly prepared and thoroughly under drained soil. I should, perhaps, add to these a few other conditions, namely, the proper and judicious management, careful and equal distribution, and, before all, the *intermittent* application of sewage to the soil, which latter is so needed to insure its aëration.

The land selected for the purification of the sewage should not be located too near a dwelling. In particular, if wells are used, it should be kept at a safe distance from them, the exact distance depending not so much on the configuration or slope of the surface as upon the inclination of the underground geological formation and strata.

We may distinguish several systems, namely, broad sewage irrigation, intermittent downward filtration and sub-surface irrigation. The Report of the Royal Commission on Metropolitan Sewage Discharge, published in 1884, defines broad irrigation as "the distribution of sewage over a large surface of ordinary agricultural ground, having in view a maximum growth of vegetation, consistent with due purification, for the amount of sewage supplied." The same report speaks of intermittent downward filtration as "the concentration of sewage at short intervals on an area of especially chosen porous ground, as small as will absorb and retain it, not excluding vegetation, but making the produce of secondary importance." In the first system, the sewage flows principally *over* the land, in the latter system it passes *through* the land. Sub-surface irrigation is a modification of the filtration system, in which the sewage is distributed in a network of tile pipes, close under the surface of the ground, whereby all offense to sight or smell is at once overcome. It is obvious that this is an important consideration wherever sewage irrigation is to be practiced close to a dwelling-house.

Broad irrigation requires very large areas of land. The land must not be continuously flooded, so that in order to manage an irrigation farm successfully, it is, at least, advisable to have pieces of fallow land, and to distribute the sewage on different portions on alternating days. By passing sewage through a properly prepared filtration area, we are enabled to effect the purification of a much larger volume, provided we maintain an intermittent discharge, so as to secure thorough aëration.

In all methods of application of sewage to land, it is advisable to intercept, at least, the coarser suspended organic matters contained in sewage, which should be dealt with separately. The irrigation field must in all cases be properly and thoroughly under drained. The preparation of the surface of the land should be simple and inexpensive, and must depend somewhat on the general topography of the field, as well as upon the kind of vegetation which it is intended to raise from sewage. It is important that the sewage be distributed evenly and in as fresh condition as possible. Much the best plan to secure an intermittent discharge and to avoid an irregular and trickling flow, is to collect the sewage from the house in a self-acting flush-tank. Wherever possible the sewage should be conveyed to the latter by gravitation, and the location of the irrigation field should be selected accordingly. Occasionally, however, pumping becomes a necessity, and this may be accomplished either by a steam pump, a gas or hot air engine, or a windmill.

I shall, hereafter, dwell more at length upon the sub-surface irrigation system, and shall explain some of its details, because I regard it as the best available system for the disposal of liquid and semi-liquid wastes of isolated country houses. Before doing so, it may be well to sum up what I have said about the methods available for disposing of sewage of isolated country houses.

Such houses as are not in reach of sewers can dispose of their liquid sewage in some cases by a direct discharge into a stream (taking this word in its widest significance) or into the sea. As a rule, however, it is absolutely necessary, and vastly better to adopt some system of purification on the premises. Of systems of sewage purification, application to the soil is preferable to mechanical filtration, or to chemical precipitation. The latter methods should only be resorted to where no land suitable for disposal is obtainable. Of the methods of applying sewage to land, broad irrigation is least favorable, as it requires a large area of land, and in cases where the field is located close to the house, it becomes objectionable. Intermittent downward

filtration, while requiring a much smaller surface, is yet open to the second objection made to surface irrigation. Far preferable, for single houses and isolated institutions, is the sub-surface irrigation system. Leaching cesspools are absolutely inadmissible, and the same is true of tight cesspools with overflows into a ditch or water course. In a few cases it may be necessary to adopt a perfectly tight cesspool without overflow, and to pump the liquid out at frequent intervals, distributing it on the land. This alternative should be resorted to only where all other methods prove objectionable or impracticable.

In the following I shall dwell more at length upon the *disposal of sewage by sub-surface irrigation*, for, in my judgment, this is the most available system for the disposal of liquid and semi-liquid wastes of isolated country houses. The system has long ago attracted public attention, and has, in recent years, been taken up by the foremost sanitary engineers, for more than any other method, it promises the entirely successful solution of the problem of sewage disposal for isolated houses. It certainly recommends itself, owing to the peculiar facilities for disposing of sewage *without creating an offense to sight or smell*, for it is only too well known that open or surface irrigation becomes, in many cases, exceedingly objectionable in close contiguity to mansions or dwellings.

The origin of the sub-surface irrigation system is usually attributed to the Rev. Henry Moule, Vicar of Fordington, the inventor of the earth-closet. He looked upon it as the best solution of the slop-water disposal question for cottages which adopted the earth-closet system. But according to Mr. Edwin Chadwick, sub-surface irrigation had previously been tried independently and systematically on a large scale by M. Charpentier, a French vine-grower, near Bordeaux. Mr. Chadwick states that the results which the latter obtained with vines and fruits, as well as with market-garden produce, were most satisfactory. The system would probably never have grown to its present popularity had it not been for Mr. Rogers Field, Mem. Inst. C. E., who, recognizing the desirability of intermittent action, invented his automatic flush-tank, which he applied successfully to the disposal of liquid household wastes. His first experiments were made at some laborers' cottages, belonging to his own estate at Sheffield, in Essex. Since then the system has been adapted to all possible conditions, and has given such satisfaction that it is now considered admirably suited to isolated houses not in reach of a sewer, but having sufficient porous or well-drained ground about them, with favorable lay of the land. Col. Geo. E. Waring, Jr., was the first to try the

system in this country, about fifteen years ago. Finding that it worked satisfactorily in the case of his own residence in Newport, R. I., then not in reach of a sewer, he adopted it afterward with success for the disposal of sewage of cottages and suburban residences, and on a larger scale for the purification of sewage at the women's reformatory prison at Sherburne, Mass., the Keystone Hotel, at Bryn Mawr, Pa., and at Lenox, Mass., for the sewage of the whole village. Since a number of years the system has been extensively applied by many sanitary and landscape engineers, and by a few progressive architects, for the disposal of sewage of isolated country houses or institutions not within reach of sewers, but liberally supplied with water and plumbing appliances.

The system is based upon the well-known fact that the aerated layers of soil *next to the surface*, the sub-surface as it were, possess in a high degree the power of destroying organic substances buried in them, by nitrification and oxidation, aided during a part of the year by vegetation, and assisted at all times by minute organisms or bacteria. The latter play an important part in the round of changes in Nature. "They are," says Tyndall, "by no means purely useless or purely mischievous in the economy of nature. They are only noxious when out of their proper place. *They exercise a useful and valuable function as the burners and consumers of dead matter, animal and vegetable*, reducing such matter with a rapidity otherwise unattainable to innocent carbonic acid and water. Furthermore, they are not all alike, and it is only restricted classes of them that are really dangerous to man. One difference in their habits is worthy of special reference here. Air, or rather the oxygen of the air, which is absolutely necessary to the support of the bacteria of putrefaction, is, according to Pasteur, absolutely deadly to the vibrios which provoke butyric acid fermentation."

I lay particular stress upon the importance of distributing the sewage close to the surface of the soil, at a depth not exceeding 10 or 12 inches. Aëration is a *conditio sine qua non* of the whole system. At greater depths oxidation and purification become very much slower, until they finally cease altogether. The *subsoil* is not able to effect a complete purification of sewage, as the oxidizing influence of the atmosphere does not so freely reach it. It is the layer of earth next to the surface, the *sub-surface*, which acts on the sewage. Hence the name of the system is derived, and it is an error, committed quite frequently, and to which I have more than once called attention, to call the system "subsoil" irrigation.

We see, then, that only where sewage is distributed close to the surface, where sufficient oxygen attaches to the particles of the soil, are the organic matters in it taken up as nourishment by the roots of plants, and reduced or destroyed by the bacteria in the soil. The liquid sewage, freed of its coarser impurities, soaks away into the porous ground, and thus becomes still more clarified by filtration, so that when removed by deep under-drains, it is generally found to be quite clear, colorless, free of taste or smell. By arranging an *intermittent* discharge, the upper layers of the soil are enabled to take up oxygen during intervals between discharges, and to prepare for the next volume of sewage, while the ground is prevented from becoming saturated, wet and swampy.

There is a radical difference between such a system and a loose or leaching cesspool. With the latter the area of soil used for purification is quite small as compared with the former, where the surface can be chosen in proportion to the amount of sewage to be disposed of, which is not a feasible thing to do with a cesspool. We all know that even in the case of a leaching cesspool, newly built and first put to use, some purification of the sewage which oozes out at its pores is accomplished by mechanical filtration. After some use, however, its pores clog up, and the soil around the cesspool becomes saturated with sewage matter, undergoing, in the absence of oxygen, a very slow process of decomposition. The sewage soaks away unpurified, polluting springs and wells, and the unwholesome gases generated taint the ground air, and, being given off at the surface, frequently enter our houses. It is for these reasons that all sanitarians look upon a leaching cesspool as a nuisance and a standing danger to health.

Briefly described, the sub-surface irrigation system consists of two parts: *First*—An absolutely tight receptacle, or sewage tank for liquid household wastes, including the contents of water-closets. *Second*—A network of common distribution drain tiles, laid a few inches below the surface of the ground, with *open joints*, so as to permit the liquid to ooze out at numerous points. This network of pipes, buried in the ground, constitutes the irrigation field.

As stated heretofore, it is an important condition to insure the successful working of the system, that the discharge of sewage from the sewage tank to the irrigation field be *intermittent*, and that, instead of a constant, dribbling stream from the tank, there be a powerful rush of sewage in a large volume, so as to secure an even distribution and the perfect filling up of all pipes. It is, to say the least, desir-

able that the discharge should not occur more frequently than *once a day*, that is, every twenty-four hours, and the size of the tank should be governed hereby.

The soil of the field should, preferably, be gravelly and porous. All tight clay soils, and ground liable to dampness, should be properly under drained by deep land drains. The sub-irrigation field should not be located too near a house, wherever there is abundance of land favorably located, permitting the sewage to flow away by gravity. As a matter of precaution, it is well that some attention be paid, in locating the irrigation field, to the direction of the prevailing winds, although as a matter of fact, a properly working irrigation field is quite inodorous. So much is this the case that the tiles may be, and in practice often are, laid under the well-kept lawns adjoining summer residences, without ever causing an offense. Another precaution to be observed where the water supply of a country house is derived from wells or springs, is, that the field should not be located near them.

The preparation of the sub-surface of the field is accomplished in the following manner: Common unglazed agricultural tiles, two inches inside diameter and one foot in length, are laid 8 or 10 inches below the surface on continuous boards, or, better, in gutters of earthenware, laid accurately in the trenches at the uniform grade required. Should the tiles ever clog up, it thus becomes an easy task to take them up, to clean them and to relay them in the gutters, an operation readily performed by a common laborer. It is quite important that there should be between the tiles at each joint, a space of about $\frac{1}{4}$ inch to facilitate the oozing out of the sewage. Small earthen caps about 3 inches long are placed over the ends of tiles at each joint to protect it from dirt or earth falling from above. It is not necessary to give the absorption tiles a greater fall than about two or three inches per 100 feet, for if laid at too steep a grade the sewage would rush to the lowest level and saturate that part of the irrigation field. It should be noted that much of the success of the system depends upon the accuracy with which the distribution tiles are laid. They should branch out from the bottom of the main carrying conduit, and special T or Y branches are manufactured for this purpose. The main drain should be laid at least two feet deep, and the 2-inch branches should be cemented until they strike the proper depth of 8 or 10 inches. The main drain conducting the sewage from the flush-tank to the irrigation field should be 4 inches in diameter, except in the case of large institutions, when the size of the flush-tank often

requires a 6-inch main conduit. It can be laid with as much fall as the layout of the land will require, but where it approaches the absorption field its fall should be limited to 4 or 6 inches in 100 feet, to prevent the sewage from running to the lower part of the field, overcharging the lower lines of drains. The distance between the lines should average about 5 feet. The ramification and the general layout of the lines will depend on the contour lines of the land. In the case of level ground the lines may be parallel to each other.

The number of feet of tiles which it is necessary to lay will depend upon the quantity of sewage delivered each day. It will vary, moreover, for like quantities of sewage, with the general character and porosity of the soil of the absorption field. Wherever the soil consists of a heavy clay or is liable to be wet or swampy, it is absolutely necessary to thoroughly under drain the field by a complete system of agricultural tiles, laid at a depth of from 4 to 5 feet, removing and discharging the purified sewage as well as any excess of soil moisture.

The flush-tank is usually built of hard-burnt brick, laid in hydraulic cement mortar, and made perfectly water tight.

An important and most necessary precaution to prevent the clogging of the siphon, which empties the tank, or of the distribution tiles, is to build in connection with the flush-tank, and between the house and the latter, an intercepting chamber or grease trap, intended to intercept all solids, undissolved paper and fatty waste matters from the kitchen. Such a chamber is, in a certain sense, a cesspool, although it differs from the ordinary objectionable device of this kind in having its liquid contents frequently changed, and in being built of small size. Its emptying and cleaning must, of course, by no means be neglected. Much of the solid matter and paper, etc., is reduced by maceration and decomposition, and flows dissolved by water into the liquid sewage chamber. The overflow pipe connecting both must dip well below the surface of the water level in the first chamber to prevent scum or grease from over-flowing into the flush-tank. The flush-tank proper should, generally, be built circular in shape, and of a size to hold one day's volume of sewage. The liquid wastes from the household are retained in this tank until it is filled, when its whole contents are suddenly delivered into the main drain, and thence into the irrigation tiles, whereby all the rows of tiles are *uniformly* charged, and the whole of the absorption field is brought into use each time the tank is emptied. If the sewage is discharged suddenly in a large volume, it oozes out, not only at the bottom, but also at the sides and top of each joint. The purification begins at

once. The clarified liquid soaks away into the ground, the impurities being retained by the earth, where they are quickly destroyed. Air enters the pores of the soil and prepares it for future use, while the tank is gradually filling for the next discharge.

The interval required between two consecutive discharges, the exact proportion between capacity of tank and size of house, between size of tank and number of feet of drain tiles, etc., are details requiring judgment, skill and experience, and which must be left to be determined in each individual case separately.

To discharge the flush-tank, recourse may be had to various mechanical appliances. The simplest arrangement, but one that requires daily attendance and some manual labor, is to place a gate valve at the outlet pipe leading from the bottom of the tank, which valve is opened or closed by hand whenever the tank becomes filled. This arrangement may answer for smaller country houses, in which the amount of water used is limited, being usually pumped into the tank by hand. An *automatic* device is preferable in many respects. This may be either a tumbler or tilting tank, or one of several siphon devices now in the market. I have, so far, found none better nor cheaper than the annular siphon, as devised by Mr. Rogers Field, C. E. If space would permit, I should illustrate and describe the manner in which I usually arrange it, but this is not possible.

My description of the system of sewage disposal by sub-surface irrigation is, I trust, sufficiently definite to give a correct general idea of it. Having spoken so much in its favor, it is but proper that I should notice and mention the objections which are, at times, brought forward both by professional and by laymen against the system.

1. It is sometimes feared that the land into which sewage is continually poured will, after some years, become saturated with sewage, its surface wet or swampy, and the whole of the irrigation field a large cesspool, spread out laterally instead of downward. There is, however, absolutely no reason for apprehending such trouble. Wherever the soil is not naturally loose and porous, *under drainage* is essential and must be provided for. If properly carried out, all superfluous moisture in the ground will be removed. *Aëration* is another essential condition, and wherever it is neglected the soil may become saturated with sewage matters. Finally, *intermittency of discharge* is required, with intervals of at least twenty-four hours between consecutive emptyings of the flush-tank. Under drainage of the soil and intermittent action of the flush-tank secure the much desired aëration of the sub-surface. This secured, oxidation and nitrification,

and the destruction of the organic particles attaching to the earth will follow with regularity.

2. Much apprehension is often felt lest such a system will not work properly in winter time, and fear is expressed about the freezing up of the ground about the absorption tiles. Experience with the system in the coldest parts of the New England States has fully removed any doubts on this point. Where the system has been in continuous use, summer and winter, it is found by practical experience that the warmth of the sewage is sufficient to keep the ground at the disposal field from freezing.

3. It is often objected that the necessary intercepting chamber for solids is in reality a cesspool. This is true to some extent; nevertheless, I always advise to build this chamber in connection with the flush-tank, but I use the utmost precaution in its construction to make it perfectly tight. As regards this intercepting chamber, it should be remembered that the liquid sewage in it is constantly changed, for a large volume of water passes through it every day. Although the chamber retains organic waste matter partially putrefied, the amount cannot be compared with that in a cesspool. Some of the solid matter is undoubtedly reduced by maceration, and being dissolved, passes into the liquid chamber, from where it is discharged into the absorption drains, to be finally oxidized and rendered innocuous. By cleaning the intercepting chamber once a month, the amount of solid putrid matter may be kept down to a minimum; consequently there will be little if any exhalation of gases of putrefaction, and inasmuch as the water level remains constant—the intercepting chamber being always filled to the overflow level—gases are not forced out as in the case of ordinary cesspools. By means of proper ventilation the intercepting chamber may be kept quite free from offense.

Perhaps I should mention here that owing to these objections attempts have repeatedly been made to do away with the intercepting chamber. But in all cases where water-closets are used and their contents discharged into the tank, it becomes imperative to prevent the solid portions of the sewage from clogging the tiles, and the siphon which discharges the flush-tank.

I well remember an attempt made some years ago to do entirely without intercepting chamber by simply surrounding the siphon (a Field annular siphon) with a double cylindrical wire screen of both coarse and fine mesh. In less than six months the tiles were entirely choked. The only alternative would seem to be to strain the solids.

English sanitary engineers, among them such well-known authorities as Mr. Rogers Field and Mr. Wm. Eassie, prefer a straining chamber. To quote Mr. Field: "The distinguishing feature of this arrangement is that there is no tank or depression for the sewage to collect in, but that the bottom of the chamber is on the same level as the bottom of the drain, so that liquid sewage passes through the chamber without any obstruction. The interception of the solids is effected by two strainers, which consist of small iron rods fixed in an iron frame, and so arranged as to be movable. The bottom of the chamber is constructed of concrete, smoothly cemented and rounded, so as to form a sort of channel for the passage of the liquid, and to enable the solids to be more readily cleaned out. This bottom also has a rapid fall from the inlet to the outlet, which still further facilitates the rapid passage of the liquid. The sides are usually formed of brick-work, and the whole is covered by a light wooden lid, opening on a hinge." With such an arrangement a man can easily remove the solids by scraping them up by means of a hoe over the edge and mixing them with dry earth. To prevent such a chamber from becoming offensive, the solids should be removed daily.

A different arrangement from the above, which has also been repeatedly suggested, is that of having in a straining chamber a perforated pail or movable iron basket, which intercepts all the solids and which must be emptied and cleaned every day.

Of the two devices, the plain strainer appears to me to be far preferable. Personally, I have not yet tried either of the arrangements described. I should be willing to substitute the straining chamber for the intercepting chamber if I could rely explicitly upon *daily* removal. The trouble involved is not large, it is true, but servants are proverbially neglectful, and the arrangement suggested certainly robs the system of one of its best features, namely, that of being automatic. If daily attendance is required, it might be just as well to require the help to empty the sewage tank daily by opening a stop-valve, and thus do away with every kind of automatic siphon or other device, while retaining the features of intermittent discharge, and of a discharge of a large volume suddenly distributed over the whole of the irrigation field.

4. Owners of country residences find an objection to the system in the necessity of frequent emptying of the intercepting chamber just referred to, which, they claim, causes more or less of a nuisance. As an answer to this objection, I would say that of the two evils of cleaning out a large, ordinary open cesspool and the comparatively speak-

ing small intercepting chamber, the latter is far preferable. But in doing so I probably overlook the fact that the same people who raise such an objection would probably never see to it that their large cesspool is cleaned, paying no attention to it as long as the sewage runs off, no matter where to.

5. It is sometimes objected that the tiles will choke and must be taken up and relaid. I cannot deny the possibility of such an occurrence, although this may only become necessary about every three years on the average. They will choke sooner if they lack the cleansing effect of a flush delivered at intervals from the sewage tank. Even supposing for a moment that the tiles would have to be cleaned and relaid every year, how little amount of labor, trouble and expense is involved in doing so, owing to their being laid in permanent gutters and close to the surface. Compare this with the trouble and annoyance of having to empty and clean a disgusting overflowing cesspool!

6. The system is objected to because the ground where the tiles are buried cannot be plowed, nor can heavy wagons drive over it without risk of breaking or displacing the pipes. This objection cannot be denied, but it is a slight one, if one at all.

7. Many people object to the cost of the automatic siphon. However expensive this may be, it cannot be considered a valid and sound objection against the system. As a matter of fact, the annular siphon, at least in the case of isolated suburban and country houses, does not cost very much. But, where this expense is objected to, the mistake should not be made of providing only one large overflow pipe from the liquid sewage tank, from which a constant small stream dribbles toward the irrigation field. This is a very imperfect and faulty arrangement. Only a short length of the tiles would receive an almost constant trickling flow of sewage, saturating the ground around it to the surface and keeping it in unwholesome condition. Moreover, the tiles would rapidly choke up with such an arrangement. Aëration, intermittent action, oxidation, powerful flushing, the uniform and entire filling of the tiles, all these conditions essential to the success of the system, would be absent.

As indicated heretofore, a stop-valve in the outlet pipe, worked by hand, may take the place of an automatic siphon. The only other admissible arrangement, and one which I have adopted with perfect

NOTE.—Since writing the above the author has constructed such a straining chamber as is described in the preceding pages in connection with a 30,000 gallon flush-tank for sewage disposal at the State Homeopathic Asylum for the Insane, at Middletown, Orange county, New York.

success, for smaller country houses, where the owners objected to the cost of an automatic flush-tank, is a sewage tank, provided with a large number of overflow pipes, all placed exactly *at the same level* in the tank—not a very easy thing to do, by the way—and all discharging simultaneously equal or nearly equal portions of the sewage into the various lines of absorption drains, thus securing a better distribution of the sewage. In this arrangement the tiles are likely to choke sooner than in the system with intermittent flush-tank, since they lack the cleansing effect of a sudden rush of water from the tank.

8. Another objection is the cost of the system. The first expense is, of course, more than that for a cesspool of moderate dimensions, but the frequently recurring expense of cleaning and emptying the latter, soon renders the sub-surface irrigation system cheaper than the ordinary cesspool. For a small country house its whole expense should not exceed \$250, and for a larger country residence the system ought not to cost more than \$500, which prices include the royalty on some of the better class of patented automatic flush-tanks.

9. It is sometimes stated that the sub-surface irrigation system is impracticable in the case of level ground, or where the lawn rises at the rear of the house, or where the main soil-pipe leaves the house at a depth below the cellar floor. To this I answer that some concessions must, under such circumstances, be made. For instance, in places where the available fall from the house to the irrigation field is slight, no plumbing fixtures should be placed in the basement, and the soil-pipe should leave the house as near the surface as practicable. In some cases it may even become necessary to build the flush-tank in embankment, hiding it in a sort of artificial terrace at the side of the house. By making the tank of a shallow depth it is usually possible to effect a suitable arrangement. In extreme cases it may become necessary to lift the sewage, after straining, and this may be accomplished by a variety of mechanical devices. Where a small air compressor may be operated in the cellar of the house, Shone's sewage ejector appears to offer a simple solution of the problem. Where steam is available, a pulsometer pump could be used for lifting the sewage. If gas is laid on to the house, or a gasoline gas machine is in operation, a gas engine or hot-air engine may prove economical. Finally, the motive force of the wind may be used for such purposes by erecting a windmill with suitable pumping apparatus. Whatever the special difficulties may be in each case they can usually be overcome at a slight sacrifice. Certainly they should not be considered objections to the system as such.

10. The objection that the sub-surface irrigation system poisons wells, may be removed by simply locating the field away from wells, or where it must necessarily be close to a house, by abolishing wells, and depending on rainwater collected in tight, underground cisterns, as a source of water supply.

11. Some think that it is impossible to purify sewage by turning it into agricultural drains located at a depth below the roots of the plants. It is hardly worth while to consider this objection, as many years of successful working of the system seem to amply contradict it.

12. The system has received condemnation because "sub-irrigation is a process faulty in principle, as it feeds vegetation by the upward rising of moisture, accompanied by evaporation, with all the chilling influences which are so injurious to vegetation as well as to human beings." I can only answer that, so far as my personal observation goes, practically no harm has ever been done to vegetation; on the contrary, it stimulates the growth of grass, of shrubbery and of fruit trees, which statement, I am confident, is borne out by the experience of other sanitary engineers.

13. Where the irrigation field is under drained, it frequently happens that at first the sewage leaks away too quickly and without being purified, at the points where the distribution tiles cross the lines of agricultural tiles. This can be remedied after a while, when the earth in the deep trenches for the land tiles settles down and solidifies.

This, I believe, comprises all the criticisms raised against the sub-surface irrigation system. While I do not wish to be understood as claiming this method of sewage disposal as a panacea for all the evils incident to country house drainage, I hold that the system is an excellent one wherever suitable land, of suitable character and of sufficient area, properly located, may be obtained. For a further detailed discussion of the whole subject I may be permitted to refer to a small volume, soon to be issued, entitled "The Disposal of Household Wastes."

APPENDIX D.

PUBLIC STATUTES.

CHAPTER 83.

OF THE STATE BOARD OF HEALTH.

SECTION 1. The governor with the advice and consent of the senate shall appoint six persons, two from the county of Providence and one from each of the other counties, who shall constitute the state board of health, one of whom shall be appointed in each year for the term of six years from the first day of July. Any appointment to fill a vacancy shall be for the remainder of the term. Of the persons so appointed, at least three shall be well educated physicians and members of some medical society incorporated by the state. The governor may remove any member for cause, at any time, upon the written request of two-thirds of the board.

SEC. 2. The board shall take cognizance of the interests of life and health among the citizens of the state; they shall make investigation into the causes of disease, and especially of epidemics and endemics among the people, the sources of mortality, and the effects of localities, employments, conditions and circumstances on the public health, and shall do all in their power to ascertain the causes and the best means for the prevention of diseases of every kind in the state. They shall publish and circulate, from time to time, such information as they may deem to be important and useful for diffusion among the people of the state, and shall investigate and give advice in relation to such subjects relating to the public health, as may be referred to them by the general assembly or by the governor when the general assembly is not in session.

SEC. 3. The state board of health shall also investigate the subject of diseases among cattle or other animals.

SEC. 4. The board shall meet in the city of Providence once in three months, and as much oftener as they may deem necessary. No member of the board, except the secretary, shall receive any compensation for his services; but the actual personal expenses of any member, while engaged in the duties of the board, shall be paid by the state.

SEC. 5. The board shall elect a well qualified physician as their secretary, who shall be *ex-officio* a member of the board, the commissioner of public health and state registrar, but he shall not be permitted to vote on any question in which he is personally interested or be entitled to any additional compensation for mileage or expenses.

SEC. 6. The secretary of the board shall make inquiry from time to time, of the clerks of town and local boards of health and practising physicians in relation to the prevalence of any disease, or knowledge of any known or generally believed source of disease or causes of general ill-health, and also in relation to the proceedings of the said boards of health, in respect of acts for the promotion and protection of the public health, and also in relation to diseases among domestic animals in their several towns; and the said clerks of town and local boards of health and said practising physicians shall give information, in reply to said inquiries, of such facts and circumstances as shall have come to their knowledge.

“SEC. 7. The secretary shall perform and superintend the work prescribed for said board by law and such other duties as the board may require; he shall prepare and publish in every calendar month a general summary of all the deaths and causes of the same which had occurred in the state during the preceding month, the same to be made up from returns of deaths which shall be sent to him on or before the tenth day of the month following the date of such deaths, by the several town and city clerks and the city registrar of Providence city; he shall also prepare and publish for general distribution a monthly circular giving information and advice in regard to the preservation of health, suitable for each particular season, and giving also such information as he shall deem of advantage to the public, as to the prevalence and character of infectious diseases of domestic animals, and for such service he shall receive the sum of seventeen hundred dollars annually, or such proportion thereof as the said board may determine. He shall hold his office during the pleasure of the board and may be removed at any regular meeting by a majority vote of the members of said board.”

SEC. 8. The governor shall provide a suitable office for the board in the city of Providence, and the actual expenses of the board and of the members thereof, when certified by the chairman and approved by the governor, shall be paid from the state treasury.

SEC. 9. The board shall make a report in print to the general assembly, annually, of its proceedings during the year ending on the thirty-first day of December next preceding, with such suggestions in relation to the sanitary laws and interests of the state as they shall deem important.

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Conn. Annual Report (11th) of the State Board of Health.
N. Y. Annual Report (9th) of the State Board of Health.
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THIRTY-SIXTH REPORT

UPON THE

REGISTRATION

OF

Births, Marriages and Deaths,

IN THE

STATE OF RHODE ISLAND

FOR THE

YEAR ENDING DECEMBER 31, 1888.

PREPARED BY

CHARLES H. FISHER, M. D.,

STATE REGISTRAR OF VITAL STATISTICS; SECRETARY OF THE STATE BOARD OF HEALTH;
COMMISSIONER OF PUBLIC HEALTH.

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HENRY E. TURNER, M. D., <i>Chairman</i>	NEWPORT.....	NEWPORT COUNTY.
SAMUEL M. GRAY, C. E.....	PROVIDENCE.....	PROVIDENCE CO.
ALBERT G. SPRAGUE, M. D.....	RIVER POINT.....	KENT COUNTY.
ALVIN H. ECCLESTON, M. D.....	WOOD RIVER JUNC.....	WASHINGTON CO.
PAUL S. REDFIELD, M. D.....	PROVIDENCE.....	PROVIDENCE CO.
HENRY S. SWAN, M. D.....	BRISTOL.....	BRISTOL COUNTY.
CHARLES H. FISHER, M. D., <i>ex officio and Secretary</i> ..	PROVIDENCE.....	PROVIDENCE CO.

State of Rhode Island and Providence Plantations.

OFFICE OF THE STATE REGISTRAR OF VITAL STATISTICS.

PROVIDENCE, December, 1889.

To the Honorable the General Assembly:

The Thirty-Sixth Annual Report upon the Registration of Births, Marriages and Deaths in Rhode Island, during the year 1888, with compendiary Tables of the results of registration in previous years, is herewith respectfully submitted.

The plan of preceding years, in regard to the general arrangement of the Tables, summaries and comments, has been followed in this report, with the addition of fifteen special Tables, and a few special changes made to meet certain requirements.

In the special Tables the object has been to present the important facts of many years of registration, as well as of single years, in such manner as to make them readily apparent, and relieve the reader of the statistics of much of the labor of personal examination of the general Tables of the preceding reports, for the purpose of ascertaining the relation the various facts bear to each other.

In the computation of the ratios of births, marriages and deaths, in proportion to the population, it will be obvious that absolutely exact results cannot be obtained for non-census years, inasmuch as the exact population cannot be known in other than those years in which a census of the population is taken.

The plan, therefore, adopted of late years in the preparation of the reports, has been to obtain from the officials of the different towns and cities the estimated population of their respective towns and cities in the middle of the year, according to their best knowledge and belief. The data thus obtained has served as a basis for the rate-computations for the different civil divisions.

The estimate of the population of the State, at the middle of the year, and upon which the birth, marriage and death rates for the State are computed, is obtained by assuming that the rate of increase of population, since the taking of the census in the middle of the year 1885, has been the same as during the years between the two last census enumerations.

No other method has seemed to present results so approximate and trustworthy.

The reports upon the records of the vital movements of the population of Rhode Island have acquired a reputation not confined to our own country, as statisticians in several countries in Europe, as well as in America, have been annual solicitors for copies for governmental and private use. It is the aim of the Registrar to make them as perfect as possible, and, therefore, entirely trustworthy.

With great respect,

CHAS. H. FISHER,

State Registrar.

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REPORT UPON THE REGISTRATION
OF
BIRTHS, MARRIAGES AND DEATHS
IN
RHODE ISLAND,
FOR THE
YEAR ENDING DECEMBER 31, 1888,
AND
FOR VARIOUS PERIODS FROM 1853 TO 1888 INCLUSIVE.

TABLE I.
GENERAL SUMMARY OF BIRTHS, MARRIAGES AND DEATHS,
IN THE STATE OF RHODE ISLAND DURING THE YEAR
1888.

TOWNS AND DIVISIONS OF THE STATE.	BIRTHS, 1888.										MARRIAGES, 1888.										DEATHS, 1888.											
	SEX.		PARENTAGE.				NATIVITY.				SEX.		PARENTAGE.		AGES Given.		Aggregate Age in years.		Average Age in years.		Aggregate Age in years of all.		Average Age in years of all.									
	Whole Number.	Males.	Females.	American.	Foreign.	Am. Father.	For. Father.	Am. Mother.	For. Mother.	American.	Foreign.	Am. Groom.	For. Groom.	Am. Bride.	For. Bride.	Whole Number.	Males.	Females.	American.	Foreign.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
Barrington.....	27	13	14	16	7	...	4	...	11	...	1	20	8	12	9	11	...	7	12	198	324	28	30	522	27	44	522	27	44
Bristol.....	100	51	49	49	31	8	12	...	23	16	3	8	1	...	127	56	71	83	44	56	71	2,021	2,839	37	87	4,860	38	36	4,860	38	36	
Warren.....	87	42	45	34	36	9	8	...	39	20	15	3	1	...	104	51	53	47	57	51	53	1,490	1,891	28	12	3,381	31	89	3,381	31	89	
BRISTOL COUNTY.....	214	106	108	59	74	17	24	...	74	47	18	7	2	...	251	115	136	139	112	114	136	3,709	5,054	32	54	8,763	35	53	8,763	35	53	
Coventry.....	103	51	49	46	43	7	7	...	33	26	2	4	1	...	81	31	47	68	13	32	46	1,246	1,780	38	93	3,026	38	79	3,026	38	79	
East Greenwich.....	73	38	35	44	23	4	2	...	26	16	6	3	1	...	69	27	42	50	19	26	42	649	1,515	24	69	2,164	31	82	2,164	31	82	
West Greenwich.....	20	13	7	20	...	...	...	...	4	4	...	...	...	...	14	10	4	12	2	8	4	509	629	63	62	758	63	16	758	63	16
Warwick.....	362	181	181	104	189	34	35	...	126	42	55	15	14	...	244	116	128	110	134	111	128	2,927	4,174	26	36	7,101	29	58	7,101	29	58	
KENT COUNTY.....	558	286	272	214	255	45	44	...	189	88	63	22	16	...	408	187	221	240	168	177	221	5,331	7,718	31	18	13,049	32	78	13,049	32	78	
James town.....	2	2	...	2	...	...	...	...	3	3	...	...	...	...	8	7	1	7	1	2	6	64	392	32	00	456	37	00	456	37	00
Little Compton.....	4	3	1	3	1	...	...	...	5	5	...	...	...	...	13	5	8	13	...	5	8	304	413	68	00	717	55	15	717	55	15
Middletown.....	29	18	11	21	8	...	...	...	22	13	...	...	...	...	22	9	13	22	...	9	13	446	655	49	55	1,101	54	54	1,101	54	54
Newport City.....	599	301	298	221	263	57	58	...	125	64	42	9	10	...	319	152	167	186	133	141	166	4,900	6,920	34	27	11,820	38	12	11,820	38	12	
New Shoreham.....	16	8	8	16	...	...	...	...	14	14	...	...	...	...	21	12	9	21	...	12	9	553	583	46	08	1,136	51	00	1,136	51	00
Portsmouth.....	23	12	11	16	2	3	2	...	10	10	...	...	...	...	21	14	10	20	...	12	10	403	485	33	58	888	43	63	888	43	63
Tiverton.....	63	33	30	27	28	6	2	...	22	18	4	...	...	...	51	23	28	22	29	23	27	719	1,056	31	35	1,775	35	50	1,775	35	50
NEWPORT COUNTY ..	736	377	359	306	302	66	62	...	181	119	46	9	10	...	458	222	236	291	167	209	239	7,389	10,504	35	35	17,898	39	93	17,898	39	93	

TABLE II.—BIRTHS, 1888.

Arranged by Months, Sexes and Divisions of the State.

MONTHS.	SEX.		DIVISIONS OF THE STATE.								
			Whole State.	Bristol County.	Kent County.	Newport County Towns.	Newport City.	Providence County Towns.	Providence City.	Pawtucket.	Woonsocket.	Washington County.
January. . . .	Males. . . .	313	12	16	9	33	64	124	22	23	10
	Females . .	299	6	24	2	25	57	125	19	28	13
	Total. . . .	612	18	40	11	58	121	249	41	51	23
February . . .	Males. . . .	297	11	25	4	15	60	122	21	32	7
	Females . .	305	7	20	6	32	65	120	25	22	18
	Total. . . .	602	18	45	10	37	125	242	46	54	25
March	Males. . . .	336	6	25	9	16	69	137	35	22	17
	Females . .	312	11	20	11	25	74	113	26	23	9
	Total. . . .	648	17	45	20	41	143	250	61	45	26
April	Males. . . .	296	6	26	6	17	65	115	28	16	17
	Females . .	266	5	19	2	23	62	100	17	16	22
	Total. . . .	562	11	45	8	40	127	215	45	32	39
May	Males. . . .	305	9	25	9	10	75	122	22	15	18
	Females . .	296	7	17	4	31	74	119	21	14	9
	Total. . . .	601	16	42	13	41	149	241	43	29	27
June.	Males. . . .	355	15	22	3	21	78	145	29	19	23
	Females . .	315	11	25	3	26	70	125	22	20	13
	Total. . . .	670	26	47	6	47	148	270	51	39	36
July	Males. . . .	374	9	30	8	39	71	143	31	23	20
	Females . .	320	10	22	7	20	74	122	34	17	14
	Total. . . .	694	19	52	15	59	145	265	65	40	34

TABLE II.—BIRTHS, 1888.—Continued.

MONTHS.	SEX.	Whole State.	DIVISIONS OF THE STATE.								
			Bristol County.	Kent County.	Newport County Towne.	Newport City.	Providence County Towns.	Providence City.	Pawtucket.	Woonsocket.	Washington County.
August....	Males....	353	5	24	3	31	73	141	35	22	19
	Females..	337	11	15	7	25	79	132	24	30	14
	Total....	690	16	39	10	56	152	273	59	52	33
September..	Males....	348	11	22	5	24	75	135	25	27	24
	Females..	352	6	25	3	23	74	158	25	16	22
	Total....	700	17	47	8	47	149	293	50	43	46
October....	Males....	363	7	19	6	37	78	136	38	28	14
	Females..	346	9	28	5	20	85	125	31	24	19
	Total....	709	16	47	11	57	163	261	69	52	33
November..	Males....	348	8	30	6	31	66	133	25	28	21
	Females..	329	15	29	7	27	84	105	22	22	18
	Total....	677	23	59	13	58	150	238	47	50	39
December..	Males....	335	7	22	8	27	74	128	29	26	14
	Females..	340	10	28	4	31	61	128	42	22	14
	Total....	675	17	50	12	58	135	256	71	48	28
Whole Year.	Males....	4,023	106	286	76	301	848	1,581	340	281	204
	Females..	3,817	108	272	61	298	859	1,472	308	254	185
	Total....	7,840	214	558	137	599	1,707	3,053	648	535	389

TABLE IV.—MARRIAGES, 1888.

Arranged by Months and Divisions of the State.

MONTHS.	Whole State, 1888.	DIVISIONS OF THE STATE.							Whole State, 1887.
		Bristol County.	Kent County.	Newport County Towns.	Newport City.	Providence County Towns.	Providence City.	Washington County.	
January	270	4	13	7	7	93	124	22	288
February	245	8	9	6	10	86	108	18	227
March	100	3	9	5	5	31	39	8	122
First Quarter ...	615	15	31	18	22	210	271	48	637
April.	302	4	25	3	9	109	132	20	214
May.	222	6	13	3	5	69	110	16	233
June	294	7	17	3	10	102	138	17	269
Second Quarter..	818	17	55	9	24	280	380	53	716
July	224	7	22	3	10	78	94	10	201
August	244	8	13	6	4	92	106	15	191
September	273	9	24	3	13	87	117	20	277
Third Quarter...	741	24	59	12	27	257	317	45	669
October	288	6	10	9	16	97	149	18	302
November.	341	7	17	7	23	115	162	26	331
December	177	5	17	4	13	53	70	24	184
Fourth Quarter..	806	18	44	20	52	255	381	68	817
Whole Year	3,022	74	189	59	125	1,012	1,349	214	2,839

* Including the cities of Pawtucket and Woonsocket.

TABLE V.—DEATHS, 1888.

Arranged by Months, Sexes and Divisions of the State.

MONTHS.	SEX.		DIVISIONS OF THE STATE.									
			Whole State.	Bristol County.	Kent County.	Newport County Towns.	Newport City.	Providence County Towns.	Pawtucket.	Providence City.	Woonsocket.	Washington County.	State Institutions.
January . . .	Males . .	297	6	7	5	16	53	14	147	28	13	8
	Females	318	15	16	5	15	52	25	133	31	20	6
	Total . .	615	21	23	10	31	105	39	280	59	33	14
February . .	Males . .	250	6	14	5	10	52	22	105	20	10	6
	Females	262	7	19	3	16	49	26	111	15	13	3
	Total . .	512	13	33	8	26	101	48	216	35	23	9
March.	Males . .	280	13	11	5	10	72	19	110	19	16	5
	Females	302	14	20	6	20	50	39	118	16	17	2
	Total . .	582	27	31	11	30	122	58	228	35	33	7
April.	Males . .	258	11	20	5	15	45	21	97	16	21	7
	Females	268	10	24	8	10	58	24	100	20	10	4
	Total . .	526	21	44	13	25	103	45	197	36	31	11
May.	Males . .	247	4	23	5	10	50	19	97	13	22	4
	Females	262	1	15	4	8	57	27	122	14	13	1
	Total . .	509	5	38	9	18	107	46	219	27	35	5
June.	Males . .	226	4	11	8	13	48	17	88	23	9	5
	Females	235	4	13	10	15	54	15	89	18	15	2
	Total . .	461	8	24	18	28	102	32	177	41	24	7
July	Males . .	312	12	16	4	11	69	27	121	25	19	8
	Females	334	22	22	5	10	81	28	128	20	15	3
	Total . .	646	34	38	9	21	150	55	249	45	34	11

TABLE V.—DEATHS, 1888.—Continued.

MONTHS.	SEX.	DIVISIONS OF THE STATE.										
		Whole State.	Bristol County.	Kent County.	Newport County Towns.	Newport City.	Providence County Towns.	Pawtucket.	Providence City.	Woonsocket.	Washington County.	State Institutions.
August....	Males..	342	22	24	12	18	70	25	125	20	20	6
	Females	380	29	26	15	17	72	33	130	25	29	4
	Total..	722	51	50	27	35	142	58	255	45	49	10
September..	Males..	261	12	20	5	15	64	19	97	13	12	4
	Females	282	15	19	5	15	66	22	102	16	18	4
	Total..	543	27	39	10	30	130	41	199	29	30	8
October....	Males..	255	9	21	5	11	60	19	95	15	12	8
	Females	281	10	26	6	19	64	29	95	15	14	3
	Total..	536	19	47	11	30	124	48	190	30	26	11
November..	Males..	222	12	8	3	12	41	24	96	15	8	3
	Females	220	7	7	2	11	44	25	94	14	13	3
	Total..	442	19	15	5	23	85	49	190	29	21	6
December..	Males..	254	4	12	3	11	49	13	125	21	12	4
	Females	246	2	14	5	11	41	25	119	10	17	2
	Total..	500	6	26	8	22	90	38	244	31	29	6
Whole Year	Males..	3,204	115	187	65	152	673	239	1,303	228	174	68
	Females	3,390	136	221	74	167	688	318	1,341	214	194	37
	Total..	6,594	251	408	139	319	1,361	557	2,644	442	368	105

TABLE VI.—DEATHS, 1888.

Exhibiting the Whole Number, the Proportion to Population, the Number of each Sex, and the Number in each Period of Life, in every Town and Division of the State.

TOWNS AND DIVISIONS OF THE STATE.	Population, 1888.*	DEATHS.				Under 1 year.	1 to 2.
		Whole Number.	Per 1000 of population.	SEX.	Number of each Sex.		
Barrington	1,400	20	14.3	Males	8	2	1
				Females...	12	2	1
Bristol	6,000	127	21.2	Males.....	56	9	3
				Females...	71	7	2
Warren	4,400	104	23.6	Males.....	51	17	4
				Females...	53	10	4
BRISTOL COUNTY..	11,800	251	21.3	Males.....	115	28	8
				Females...	136	19	7
Coventry	5,000	81	16.2	Males.....	31	4	...
				Females...	47	8	1
East Greenwich...	2,800	69	24.6	Males.....	27	5	4
				Females...	42	5	2
West Greenwich ..	850	14	16.5	Males.....	10	2	...
				Females...	4	...	...
Warwick	14,018	244	17.4	Males.....	116	34	10
				Females...	128	26	6
KENT COUNTY....	22,668	408	18.4	Males.....	187	45	14
				Females...	221	39	9
Jamestown	520	8	15.4	Males.....	2	...	...
				Females...	6	...	...
Little Compton...	1,050	13	12.4	Males	5	...	...
				Females...	8	...	1
Middletown	1,205	22	18.3	Males.....	9	...	...
				Females...	13	1	1
NEWPORT CITY...	21,266	319	15.0	Males.....	152	33	13
				Females...	167	31	9
New Shoreham...	1,312	21	16.0	Males. ...	12	...	...
				Females...	9	1	...
Portsmouth	2,000	24	12.0	Males. ...	14	5	...
				Females...	10	2	...
Tiverton	2,775	51	18.3	Males.....	23	5	...
				Females...	28	4	2
NEWPORT COUNTY.	30,128	458	18.1	Males.....	217	43	13
				Females...	241	39	13
Burrillville	5,400	123	22.8	Males.....	59	19	2
				Females...	64	14	5
†Cranston	5,000	100	20.0	Males.....	52	8	4
				Females...	48	7	2
Cumberland	7,263	177	24.4	Males.....	74	24	2
				Females...	103	19	6

* Estimated.

† Not including State Institutions.

TABLE VI.—DEATHS, 1888.—Continued.

2 to 3.	3 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	Age not stated.
....	....	1	....	....	1	1	....	1	1	....	....	....	....
....	1	1	1	....	1	1	1	1	1	1	....	....	....
2	1	2	1	2	3	6	5	2	5	10	5	....	....
2	....	4	2	1	12	6	7	7	3	8	7	3	....
....	1	2	1	3	1	....	....	2	2	14	3	1	....
1	....	2	2	2	7	....	2	6	4	4	9	....	....
2	2	5	2	5	5	7	5	5	8	24	8	1	....
3	1	7	5	3	20	7	10	14	8	13	16	3	....
1	3	3	....	2	1	1	3	2	4	6	3	....	1
2	....	1	1	1	6	6	3	3	4	6	4	1	....
....	2	3	1	....	4	1	....	1	1	4	1	....	....
1	5	4	1	....	2	3	2	3	2	4	3	5	....
....	....	....	1	....	....	....	....	....	4	2	1	....	....
....	....	....	....	....	....	1	....	....	1	1	1	....	....
2	1	2	5	8	12	6	6	12	8	4	4	2	....
1	8	9	2	7	11	3	13	7	13	8	12	2	....
3	6	8	7	10	17	8	9	15	17	16	9	2	1
4	13	14	4	8	19	13	18	13	20	19	20	8	....
....	....	....	....	1	....	1	....	....	....	....	....	....	....
....	....	....	....	....	1	....	....	....	2	2	1	....	....
....	....	1	....	....	....	....	....	1	1	....	1	1	....
....	....	....	....	....	....	....	4	....	2	1	....	....	....
1	1	....	....	....	1	....	....	3	1	....	1	1	....
....	1	....	....	....	1	1	....	2	1	4	1	....	....
5	8	8	....	5	5	10	8	10	22	15	8	1	1
4	....	7	4	5	10	10	3	22	26	20	12	4	....
....	....	....	....	....	2	1	....	2	2	4	....	....	1
....	....	....	....	....	....	1	....	....	2	2	3	....	....
....	....	1	....	....	1	1	1	1	....	1	2	....	1
....	....	1	....	....	....	1	....	....	3	2	....	1	....
2	....	2	1	1	....	3	2	2	1	3	1	....	....
2	1	1	....	3	1	2	1	....	2	5	3	1	....
8	9	12	1	7	9	15	12	19	27	23	13	3	3
6	2	9	4	8	15	14	9	24	38	36	20	6	....
3	....	5	1	2	5	2	1	4	5	6	3	..	1
2	1	....	1	4	8	4	2	7	6	6	3	1	....
....	1	2	2	....	7	5	3	2	3	11	3	....	1
1	....	2	....	2	6	1	2	4	6	8	5	2	....
2	6	4	1	4	2	3	6	7	7	2	3	1	....
2	2	5	4	2	5	12	12	6	12	8	8	....	....

TABLE VI.—DEATHS, 1888.—Continued.

TOWNS AND DIVISIONS OF THE STATE.	Population, 1888.*	DEATHS.				Under 1 year.	1 to 2.
		Whole Number.	Per 1000 of population.	SEX.	Number of each Sex.		
East Providence...	7,800	120	15.4	Males.....	60	10	3.
				Females...	60	7	2
Foster	1,390	19	13.7	Males.....	9	....	....
				Females...	10	....	....
Glocester.....	2,100	39	18.6	Males.....	21	1	2
				Females...	18	3	1
Johnston.....	8,500	161	18.9	Males.....	91	24	6
				Females...	70	6	6
Lincoln	20,000	434	21.7	Males.....	207	60	15
				Females...	227	56	30
North Providence.	1,550	38	24.5	Males.....	22	2	2
				Females...	16	3	2
North Smithfield..	3,160	42	13.3	Males.....	23	2	1
				Females...	19	....	3
PAWTUCKET	25,500	557	21.8	Males.....	239	56	20
				Females...	318	70	12
PROVIDENCE CITY.	125,000	2,644	21.1	Males.....	1,303	259	78
				Females...	1,341	215	69
Scituate.....	3,600	55	15.3	Males.....	30	1	1
				Females...	25	....	1
Smithfield.....	2,500	53	21.2	Males.....	25	2	....
				Females...	28	10	1
Woonsocket	20,000	442	22.1	Males.....	228	61	20
				Females...	214	59	13
PROVIDENCE Co..	238,763	5,004	21.0	Males.....	2,443	529	156
				Females...	2,561	469	154
Charlestown.....	1,050	19	18.1	Males.....	13	....	1
				Females...	6	....	....
Exeter.....	1,050	11	10.5	Males.....	4	1	....
				Females...	7	....	....
Hopkinton.....	2,767	50	18.1	Males.....	25	3	1
				Females...	25	4	1
Narragansett	1,000	16	16.0	Males.....	8	1	1
				Females...	8	2	....
N. Kingstown	3,870	69	17.5	Males.....	38	6	2
				Females...	31	4	....
S. Kingstown.....	4,600	59	12.8	Males.....	20	4	....
				Females...	39	7	1
Richmond.....	1,800	26	14.4	Males.....	11	3	1
				Females...	15	1	1
Westerly.....	6,800	118	17.4	Males.....	55	8	2
				Females...	63	10	1
WASHINGTON Co..	22,937	368	16.0	Males.....	174	26	8
				Females...	194	28	4
State Ins. Cranston.	1,400	105	75.0	Males.....	68	4	2
				Females...	37	3	....

* Estimated.

TABLE VI.—DEATHS, 1888.—Continued.

2 to 3.	3 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	Age not stated.
1	1	2	2	3	2	6	4	8	10	5	2	....	1
1	....	1	4	3	2	6	6	7	6	6	5	3	1
....	....	....	....	....	....	....	1	....	3	1	3	1	....
....	....	....	....	....	....	1	....	2	2	1	4	....	....
....	....	....	....	....	3	....	1	2	4	5	1	1	1
....	....	1	1	....	2	....	....	2	1	3	3	1	....
3	7	12	6	....	4	5	5	5	5	8	1	....	....
2	5	5	3	4	5	7	5	2	7	6	7	....	....
15	9	12	3	9	19	5	17	15	13	13	2	....	....
3	11	11	4	12	19	18	15	22	12	9	3	2	....
....	3	....	2	....	2	2	1	....	3	5	....	....	....
....	....	....	1	1	....	....	1	....	4	3	1	....	....
1	3	2	....	....	4	1	2	1	1	2	3	....	....
....	....	....	1	4	3	2	....	....	1	1	3	....	1
2	9	5	3	6	22	13	8	28	34	20	12	1	....
3	19	9	6	12	33	26	18	30	29	27	17	5	2
45	55	60	27	37	134	107	142	114	111	87	44	3	....
34	53	54	34	48	145	125	123	124	136	96	75	10	....
1	....	1	....	....	4	2	1	2	7	7	3	....	....
....	1	1	....	2	2	....	4	2	3	3	3	2	1
1	3	1	....	1	1	1	1	1	5	6	2	....	....
....	....	2	....	1	1	1	2	2	1	3	2	1	....
13	15	15	5	3	24	17	14	11	9	13	5	2	1
6	19	11	3	11	15	13	18	9	14	13	8	2	....
87	112	111	52	65	233	169	207	200	220	191	87	9	5
54	111	102	62	106	246	216	208	219	240	193	147	29	5
....	....	....	1	....	1	3	1	....	1	2	3	....	....
....	....	....	....	2	1	....	1	....	....	....	1	1	....
....	....	....	....	....	....	....	1	....	1	1	....	....	....
1	....	....	....	....	....	....	....	2	....	2	1	1	....
....	1	1	....	2	2	1	....	1	2	6	3	2	....
1	....	....	....	....	4	....	4	2	1	5	2	1	....
1	....	....	....	....	1	1	....	....	1	2	....	....	....
....	1	....	....	....	1	....	2	1	....	1	....	....	....
....	2	....	....	1	....	2	4	5	5	5	6	....	....
1	....	1	....	2	....	3	1	1	6	6	3	3	....
....	....	....	....	3	....	....	1	1	2	4	2	3	....
....	....	....	1	1	3	1	1	3	3	10	5	1	2
....	....	....	....	....	....	....	....	1	1	2	3	....	....
....	1	1	....	....	....	3	1	....	1	3	3	....	....
....	....	3	4	3	5	6	4	1	6	8	4	1	....
3	....	5	....	2	6	4	5	5	6	8	7	1	....
1	3	4	5	9	9	13	11	9	19	30	21	6	....
6	2	7	1	7	15	11	15	14	17	35	22	8	2
....	....	....	2	3	4	15	10	10	9	6	3	....	....
1	....	....	....	1	6	5	6	....	4	8	3	....	....

TABLE VI Continued.—DEATHS, 1888.—RECAPITULATION.

DIVISIONS OF THE STATE.	Population, 1888. *	DEATHS.				Under 1 year.	1 to 2.
		Whole Number.	Per 1000 of Pop- ulation.	SEX.	Number of each Sex.		
BRISTOL COUNTY..	11,800	251	21.3	Males.....	115	28	8
				Females...	136	19	7
KENT COUNTY....	22,668	408	18.4	Males.....	187	45	14
				Females...	221	39	9
NEWPORT COUNTY.	30,128	458	18.1	Males.....	217	43	13
				Females...	241	39	13
PROVIDENCE Co ..	238,763	5,004	21.0	Males.....	2,443	529	156
				Females...	2,561	469	154
WASHINGTON Co. .	22,937	368	16.0	Males.....	174	26	8
				Females...	194	28	4
STATE INST'S	1,400	105	75.0	Males.....	68	4	2
				Females...	37	3	....
WHOLE STATE....	323,416	6,594	20.4	Males.....	3,204	675	201
				Females...	3,390	597	187

* Estimated.

TABLE VI Continued.—DEATHS, 1888.—RECAPITULATION.

2 to 3.	3 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	Age not stated.
2	2	5	2	5	5	7	5	5	8	24	8	1	.....
3	1	7	5	3	20	7	10	14	8	13	16	3	.....
3	6	8	7	10	17	8	9	15	17	16	9	2	1
4	13	14	4	8	19	13	18	13	20	19	20	8	....
8	9	12	1	7	9	15	12	19	27	23	13	3	3
6	2	9	4	8	13	14	9	24	38	36	20	6	....
87	112	111	52	65	233	169	217	210	220	191	87	9	5
54	111	102	62	106	246	216	208	219	240	193	147	29	5
1	3	4	5	9	9	13	11	9	19	30	21	6	....
6	2	7	1	7	15	11	15	14	17	35	22	8	2
....	....	....	2	3	4	15	10	10	9	6	3	....	....
1	....	....	....	1	6	5	6	....	4	8	3	....	....
101	132	140	69	99	277	227	254	268	300	290	141	21	9
74	129	139	76	133	319	266	266	284	327	304	228	54	7

TABLE VII.—CAUSES OF DEATH, 1888.

Arranged Alphabetically; showing the Number of each Sex, who died from each cause, in each month and in the whole year 1888; also the Number of American and of Foreign Parentage, from each cause, for the year.

CAUSES OF DEATH.	Jan.		Feb.		Mar.		April.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		PARENTAGE.			SEX.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Am.	For.	M.	F.	Total.	
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Accidents, unspecified	4	1	2	1	1	4	1	3	2	3	2	3	2	2	1	1	3	..	2	3	5	..	2	1	16	26	31	11	42	
“ Asphyxia.....	..	1	..	1	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	4	5	..	5
“ Burns and Scalds..	3	1	..	1	1	2	1	1	1	1	1	1	2	1	..	..	1	2	4	1	..	..	3	2	7	20	15	12	27
“ Drowning	1	..	..	1	..	3	1	6	..	4	1	5	1	4	..	4	1	2	2	..	6	..	8	..	15	31	41	5	46
“ Exposure to Cold..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	1	1
“ Falls.....	..	1	..	1	1	1	..	3	..	..	..	2	..	1	..	1	3	..	1	..	2	..	2	1	8	10	17	1	18
“ Fractures and Con- tusions.....	1	..	..	..	..	..	..	1	2	..	1	2	1	..	..	..	..	1	1	..	1	..	..	3	5	3	5	8	8
“ Heat.....	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	1
“ Poison.....	..	1	..	..	..	..	..	3	1	..	1	..	1	2	1	1	1	1	1	..	..	..	..	..	6	6	8	4	12
“ Railroad.....	4	1	..	2	..	3	..	3	2	..	1	1	1	4	..	1	1	..	5	..	..	..	2	..	7	18	21	4	25
“ Strangulation.....	..	..	..	..	..	..	..	..	..	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	2	1	1	2
“ Suffocation.....	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	1
“ Surgical Operation.	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2	2	..	2
Abortion.....	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	2	2
Abscesses, unspecified.....	3	..	1	1	1	1	1	2	2	..	1	..	1	1	1	1	1	..	2	..	1	2	..	..	7	12	11	8	19
“ Rectum.....	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	1
Alcoholism	3	..	..	1	1	1	1	1	1	..	..	1	1	1	1	1	..	..	1	..	..	..	..	..	2	9	6	5	11
Anaemia.....	1	1	..	1	1	1	1	1	1	3	2	..	..	..	1	..	1	..	1	..	1	..	1	..	3	10	5	8	13
Aneurism.....	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	3	3	..	3
“ of Abdomen	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	1

CAUSES OF DEATH.	Jan.		Feb.		Mar.		April.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		PARENTAGE.		SEX.								
																									Am.		For.		M.		F.		Total.		
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
Aneurism, Aorta.....														1	1											1	1	1	1	1	1	1	1	2	
“ Angina Pectoris.....	1								1				1	1					1	1						5	4	7	2				9		
Apoplexy.....	10	9	2	7	12	8	9	12	6	16	12	9	9	12	10	5	3	6	9	14	8	10	6	7	126	85	96	115	211						
Ascites.....								1																	1					1				1	
Asthenia.....							1			1	1	2	2	4	1	1	1	1	3	1	2	1	2	12	12	12	12	12	12	12	12	24			
Asthma.....					3	1			2	1	1	1					1					3	1	4	10	6	8	14					14		
Atelectasis Pulmonum.....			1																						1		1		1				1	1	
Atrophy, Prog. Muscular.....																					1				1		1		1				1	1	
Bladder Disease.....													1	2											1	2	3		3				3	3	
“ Inflammation.....																		1							1		1		1				1	1	
Bone Diseases.....											1														1		1		1				1	1	
Bowel Diseases.....			1										1												1		1		1					1	1
“ Inflammation.....	2					1	1					2	3	1	2	1	1	1	1	1	1	1	2	6	11	7	10	17					17		
“ Ulceration.....			1						1																1	2	1	2	3					3	3
Brain Diseases.....	2	2	1	2	1	2	2	3	1	2			3	1	2			3	1	3	2	1	2	21	15	15	21	36					36		
“ Congestion.....	1	1	1		1		1		1	1	1	1	1				1							7	7	8	6	14					14		
“ Inflammation.....			1		1								1		2	1	2	2				3	1		6	8	10	4	14				14		
“ Softening.....	1	1			1		3		1	4				1	1	1	1	1	2	1	1	1	15	5	11	9	20					20			
Bronchitis, Acute.....	15	13	8	11	13	20	5	14	7	10	8	4	6	10	1	4	6	5	8	5	5	4	11	8	70	131	93	108	201					201	
“ Chronic.....	2	2	2	3		1	2		1	2	2	1	1		2	2	1					2	1	9	18	12	15	27					27		
Calculus.....																	1							1		1		1					1	1	
Cancer, unspecified.....	3	1	2			2	1	2	3	1	2	4	4	1	4	9		7	3	6	1	2	4	44	20	21	43	64					64		
“ of Abdomen.....					1				1		1		1				1						3	2	4	1	5						5	5	
“ Axilla.....																							1		1		1		1				1	1	
“ Bowels.....			1																				1		1		1		1				1	1	
“ Breast.....	4		3		1		3		4						2				1				16	5		21							21	21	

TABLE VII.—CAUSES OF DEATH, 1888.—Continued.

CAUSES OF DEATH.	Jan.		Feb.		Mar.		April.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		PARENTAGE.			SEX.				
	M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		Am.		For.		M. F.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Cancer of Colon.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	...	1	...	1	...	1	1
“ Face and Nose.....	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	...	1	...	1	...	1	1
“ Hand.....	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	...	...	1	...	1	...	1	1
“ Inguinal.....	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	...	1	...	1	...	1	1
“ Kidney.....	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	...	1	...	1	...	1	1
“ Liver.....	1	1	1	..	1	1	1	1	1	1	..	..	1	2	1	1	3	2	1	2	2	..	2	..	14	9	14	9	14	23	1	23
“ Neck.....	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	...	1	...	1	...	1	1	1
“ Esophagus.....	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	...	1	...	1	...	1	2
“ Omentum and Mes- entery.....	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	...	2	...	1	1	2	2
“ Ovaries.....	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	1	1	...	2	2	2	2
“ Pylorus.....	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	...	1	...	1	...	1	1
“ Rectum.....	1	..	1	..	..	..	..	..	..	1	..	..	1	..	..	1	..	..	1	..	..	..	..	..	5	...	3	2	3	2	5	5
“ Stomach.....	3	2	3	1	2	3	1	2	2	1	1	2	2	1	1	2	2	4	1	..	2	..	2	..	19	15	20	14	34	2	2	2
“ Throat.....	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	2	..	2	2	2
“ Tongue.....	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	...	1	...	1	...	1	1
“ Uterus.....	3	2	..	..	1	..	1	..	2	1	6	1	..	2	3	1	..	2	..	2	..	2	..	15	8	1	...	23	1	23	23	23
Cellulitis, Pelvic.....	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	...	1	...	1	...	1	1	1
Cerebritis.....	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	...	1	...	1	...	1	1	1
Childbirth.....	2	3	2	1	1	2	1	2	2	2	2	2	2	2	1	1	2	..	2	..	2	..	2	..	2	1	1	1	2	21	21	21
“ Puerperal Conv.....	..	..	1	1	1	1	1	1	1	1	1	1	1	2	..	1	..	1	..	1	..	1	..	1	5	...	6	...	6	...	6	6
“ Fever.....	1	3	2	2	1	1	2	1	1	2	1	2	1	1	1	1	1	2	1	2	..	1	..	2	14	...	16	...	16	...	16	16
“ Hemor.....	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	...	2	...	2	2	2
“ Placenta Prævia....	..	..	..	..	..	..	..	..	..	1	1	..	1	..	1	..	1	..	..	..	..	..	..	1	1	1	1	1	1	1	2	2

[illegible]

TABLE VII.—CAUSES OF DEATH, 1888.—Continued.

CAUSES OF DEATH.	Jan.		Feb.		Mar.		April.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		PARENTAGE.		SEX.							
																									Am.		For.		M.		F.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Embolism.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	3	1	1	3	4
Empysema.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	1	..	1	3	2	2	4
Encephalitis.....	1	..	1	..	1	..			
Enteritis.....	2	2	1	2	2	3	2	..	2	1	2	2	1	3	7	5	2	2	4	1	2	2	1	..	23	30	26	27	53					
“ Gastro.....	1	3	1	1	..	..	1	..	1	1	2	1	3	4	5	6	2	1	3	..	3	1	..	..	13	26	20	19	39	
“ Tubercular.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	1	1	1	2
Entero-Colitis.....	2	..	..	..	..	..	..	..	1	..	..	2	..	4	3	..	1	..	..	..	..	..	..	..	8	6	8	6	14
Epilepsy.....	..	1	..	2	..	1	1	1	1	1	1	1	..	..	..	3	..	1	1	..	1	..	..	..	7	9	11	5	16
Epistaxis.....	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	1	2
Erysipelas.....	2	3	3	..	..	1	1	2	1	2	..	2	..	2	..	1	1	..	..	1	2	1	1	..	13	12	13	12	25	
Exhaustion.....	..	1	1	2	..	..	..	..	..	..	1	1	..	1	..	..	..	..	2	..	..	..	..	..	5	4	3	6	9
Fevers, unspecified.....	..	1	..	..	1	..	..	..	..	..	3	..	2	..	..	..	..	1	1	1	..	1	..	..	1	10	8	3	11
“ Intermittent.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	1	..	..	..	..	1	3	2	2	4
“ Malarial.....	2	1	..	..	2	1	2	4	2	4	2	1	4	3	2	3	4	2	2	..	..	..	3	..	13	35	25	23	48
“ Remittent.....	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	2	2
“ Typhoid.....	7	2	4	1	4	3	4	4	6	5	1	2	1	5	14	19	20	12	24	14	10	11	22	29	87	137	117	107	224					
“ Typho-Malarial.....	1	1	..	..	..	2	..	1	1	1	1	1	3	..	1	1	2	1	..	..	..	..	..	..	6	11	8	9	17
Fistula.....	1	1	1	..	1	1				
Gall Stones.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	1	1	..	2	2
Gangrene.....	2	..	..	1	1	2	1	1	2	1	1	1	1	1	..	..	..	..	..	..	..	2	..	..	11	4	8	7	15
“ Senile.....	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	4	..	2	2	4
Gastritis, Acute.....	1	2	4	1	2	2	1	1	1	1	1	1	2	1	3	1	1	..	..	..	2	1	..	..	13	14	11	16	27
“ Chronic.....	..	2	..	..	..	..	..	..	..	..	1	..	1	..	..	..	1	..	..	..	..	..	..	..	..	5	2	3	5
Glottis, Disease of.....	1	1	1	..	1	..	1	1				

TABLE VII.—CAUSES OF DEATH, 1888.—Continued.

CAUSES OF DEATH.														PARENTAGE.				SEX.										
Jan.		Feb.		Mar.		April.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		Am.	For.	M.	F.	Total.
M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.					
Influenza...																								2	5	7		
Insanity	1	1		2	2	3	1	1	3	1		2	1	3	1									24	19	43		
Intemperance.....						1																		2	1	3		
Intussusception.....												1												1	2	3		
Jaundice		1	1				1																	4	1	5		
Kidney Disease.....	3		2	1	1																			6	7	13		
" Bright's Disease..	4	2	8	5	4	9	6	3	7	7	6	4	4	9	1	8	7	8	8	7	11	11		89	61	150		
Laryngitis.....	1	1				1																		2	4	6		
Liver Disease.....		1	3	2	2	1	3	1	1	2	1	4	2	1	3	1	1	1	1	1	1	1		18	14	32		
" Atrophy.....										1														1	...	1		
" Cirrhosis.....	2	1				1	1	2				1	1	1	1	2	4				2			8	11	19		
Locomotor Ataxia.....										1														1	2	3		
Lung Diseases.....	1					1	1																	2	2	4		
" Fever.....	1	1																						...	2	2	2	
" (Edema.....	2					1	1				1													4	1	2	5	
Malformations, unspecified...		1	1		1	1	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1		7	6	13		
" Cleft Palate.....																								1	...	1		
" Heart.....						1																		2	...	2	2	
Malignant Pastule.....																								...	2	...	2	
Malnutrition.....									1		1	1	1	3	1	2	1	2	1	2	...	...		6	6	12
Marasmus.....	5	4	2	1	1	3	1	2	3	2	5	2	6	2	3	2	2	2	3	5	3	4		33	30	63		
" Senile.....	1								1		1	1									1	...		3	2	5		
Measles.....	1					2					1	1												3	8	11		
Meningitis.....	6	9	6	3	9	2	9	4	4	1	5	4	3	5	3	3	4	1	5	8	4	5	6		53	61	114	

CAUSES OF DEATH.	Jan.		Feb.		Mar.		April.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		PARENTAGE.		SEX.						
	M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		Am.		For.		M.		F.		Total.
Meningitis, Cerebro-Spinal.....	2	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	3	3	1	1	1	14	8	8	14	22	22			
“ Spinal.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	2	2	3	3	3	2	5	5
“ Tubercular.....	..	1	1	1	1	2	1	2	2	1	2	2	1	1	1	1	2	1	1	1	1	1	1	8	12	9	11	20	20				
Myelitis.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	1	1	1
Nephritis.....	1	4	1	4	3	1	1	3	2	2	3	1	2	3	2	1	1	1	1	3	3	3	3	23	19	24	18	42	42				
Nervous Prostration.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	2	2	2	2	2
Neuralgia.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	1	1	1	1
Obstipation.....	1	1	..	..	..	..	..	..	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	3	3	9	7	5	12	12	
Old Age.....	11	14	9	16	6	18	13	13	12	22	8	9	8	12	11	25	6	15	6	15	8	11	10	12	198	92	108	182	290	290			
Otitis.....	..	..	..	..	..	..	..	..	..	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	..	..	2	2	2	2
Paralysis.....	4	8	6	9	8	5	9	12	4	7	6	6	6	6	5	8	2	3	7	13	3	4	3	4	103	45	63	85	148	148			
Paraplegia.....	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	2	2	2	2	2
Peritonitis.....	3	1	4	1	2	2	5	2	3	3	3	3	1	5	7	3	2	2	2	2	3	1	1	4	24	36	23	37	60	60			
“ Tubercular.....	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	1	1	1	1	2	2
Perityphlitis.....	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	1	1	1	4	..	2	2	2	4	4
Pharyngitis Membranous.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	1	1	1	1
Pleurisy.....	1	1	2	1	4	2	..	1	..	..	..	..	1	1	1	1	1	1	1	..	..	2	..	5	12	13	4	17	17		
Pneumonia.....	31	32	34	35	57	36	41	30	22	13	13	6	9	4	4	7	4	6	15	18	18	14	16	19	210	274	264	220	484	484			
“ Cong. of Lungs.....	4	2	1	2	3	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17	7	10	14	24	24				
Prostate Disease.....	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	2	2	1	3	3	3	3	3	3
Prostatitis.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	1	1	1	1	1
Purpura Hemorrhagica.....	1	..	..	..	..	2	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	3	1	1	1	1	3	4	4	4
Pyæmia.....	..	..	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	6	6	1	5	1	6	6	6	6
Quinsy.....	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	..	..	1	1	1	1
Rachitis.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	..	..	1	1	1	1
Rheumatism.....	2	..	1	..	3	3	1	2	6	..	2	2	4	..	1	3	..	..	..	..	..	1	1	1	15	18	11	22	33	33	

TABLE VII.—CAUSES OF DEATH, 1888.—Continued.

CAUSES OF DEATH.	Jan.		Feb.		Mar.		April.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		PARENTAGE.		SEX.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Am.	For.	M.	F.	Total.	
Rheumatism, Chronic.....	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	1	1	1	1	2
Scarlatina.....	9	10	11	8	4	5	11	5	3	5	1	3	..	1	..	1	..	1	1	1	3	..	1	..	91	116	101	106	207	
Scrofula.....	1	..	..	1	1	..	1	..	1	..	..	..	1	..	..	..	..	..	1	..	2	..	..	..	4	4	5	3	8
Septicæmia.....	1	..	2	1	2	3	1	1	1	..	2	2	..	..	..	..	2	..	1	..	2	1	..	..	13	11	14	10	24
Shock.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	1	1	1
Skin Diseases.....	..	..	..	..	1	1	..	1	..	1	1	1	..	1	..	1	..	..	..	..	1	1	..	..	2	5	5	2	7
Spina Bifida.....	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	2	..	..	..	2	2	2	2	4
Spinal Diseases.....	3	1	..	1	..	..	..	..	..	1	..	..	..	..	..	..	2	..	..	..	2	..	1	1	3	7	5	5	10
Spleen Diseases.....	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	1
Stomach Diseases.....	2	..	2	1	1	..	2	..	2	..	2	1	..	2	1	..	3	..	2	2	..	..	..	..	8	10	11	7	18
“ Inflammation.....	1	1	1	1	..	1	1
“ Ulceration.....	2	1	1	1	..	1	1	1	1	..	2	2	2
Stomatitis.....	3	1	2	3	3
Suicide, unspecified.....	1	..	..	..	..	..	..	..	..	3	..	..	..	..	2	1	..	..	..	..	..	..	..	..	4	3	6	1	7
“ by Arsenic.....	1	1	..	1	1	1	2	..	2	2
“ Cutting Throat.....	1	1	1	2	..	2	..	2	2
“ Hanging.....	2	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	1	2	..	6	1	7	..	7	7
“ Leaping.....	1	2	2	1	1	1	1	1	2	..	2	2
“ Potass. Cyanide.....	1	1	1	1	1	1	..	1	1
Syncope.....	1	1	1	1	1
Synovitis.....	1	1	..	1	1	1
Syphilis.....	1	1	..	1	1	..	1	..	1	1	1	1	..	1	..	1	..	1	5	3	3	5	8	8
“ Congenital.....	1	..	1	1	1	2	1	..	3	3	3
Tabes Mesenterica.....	1	1	..	1	..	1	2	2	2	2	5	6	4	7	11	11

CAUSES OF DEATH.	Jan.		Feb.		Mar.		April		May		June		July		Aug.		Sept.		Oct.		Nov.		Dec.		PARENTAGE.			SEX.		
	M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		M. F.		Am.	For.	M.	F.	Total.	
Teething.....	1	1	3	3	1	2	2	2	2	3	2	4	2	4	2	4	1	1	1	1	1	1	1	1	10	25	12	23	35	
Tetanus.....									1	1		1		1		1								5	1	3	3	6		
Thrombosis.....	1	1																								2	1	1	2	
Tonsillitis.....				1								1					1									3	2	1	3	
Trismus Nascentium.....																			1		2			1	2	1	2	3		
Tuberculosis.....	1	1	2	2	1	1	2	2	2	4	1	1	2	3	1	1	3	1	1	1	3			18	14	19	13	32		
Tumors.....			2	1									1	1									1	6	1	2	5	7		
of Abdomen.....	1	1				1						1	1										3	3	2	4	6			
Brain.....																							1	1			1	1		
Liver.....	1	1																								1	1	1	1	
Ovaries.....			1	1			2						1											1	4			5	5	
Throat.....	1	1																								1		1	1	
Uterus.....								1																2			2	2	2	
Uremia.....	1	1	1	1			1	1	1				1	1											4	2	2	4	6	
Urethra, Rupture of.....									1																	1	1	1	1	1
Uterus, Stricture.....										1							1							2			2		2	
Uterus, Rupture of.....									1																	1		1	1	
Vomiting.....																											2		2	2
Whooping Cough.....	1	3	4	1	1	3	1	1	1	1	1	2	1	6	4					5	1	3	4	1	16	28	17	27	44	
Worms.....																											1		1	1
Unknown.....	2	3	2	1	2	5			3		1	1					1	1		2	1	1		17	11	9	19	28		

TABLE VIII.—CAUSES OF DEATH, 1888.—Continued.

CAUSES OF DEATH.	Under 1.		1 and under 2.		2 to 3.		3 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 to 90.		90 and over.		Age not stated.		SEX.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
Dysentery, Acute.....	5	5	4	2	1	..	6	2	3	1	1	1	..	2	1	4	1	3	1	8	3	13	2	7	27	48	75	
Typhoid.....	1	1	2	..	2		
Embolism.....	1	..	1	1	1	3	4			
Empysema.....	..	1	1	1	1	..	1	..	1		
Encephalitis.....	..	1		
Enteritis.....	8	3	4	2	2	..	2	1	..	1	1	2	2	1	4	4	4	1	1	4	4	1	1	1	4	26	27	53			
Gastro.....	11	8	3	1	2	1	1	1	..	2	4	2	4	2	20	19	39			
Tubercular.....	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	2
Enterocolitis.....	6	4	1	..	..	..	1	..	1	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	8	6	14
Epilepsy.....	..	..	1	..	..	..	1	1	1	..	3	..	1	2	2	1	1	..	..	..	..	1	..	1	..	..	..	..	..	11	5	16
Epistaxis.....	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	2
Erysipelas.....	4	4	1	..	..	..	..	..	..	..	..	..	2	1	1	1	1	4	1	1	1	4	1	2	1	..	..	..	..	13	12	25
Exhaustion.....	2	2	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	1	1	1	..	1	..	..	..	3	6	9
Fevers, unspecified.....	3	1	..	..	..	..	2	1	1	..	1	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	8	3	11
Intermittent.....	..	..	1	..	..	..	..	..	..	..	1	..	1	..	..	..	..	1	1	..	1	..	..	..	..	..	..	..	..	2	2	4
Malarial.....	3	1	..	..	2	1	1	1	2	3	2	..	3	5	3	3	3	3	3	3	3	5	3	1	3	..	..	..	..	25	23	48
Remittent.....	..	1	1	1	2			
Typhoid.....	1	..	..	1	1	4	1	7	4	18	9	14	26	42	33	14	15	9	7	4	8	2	1	1	2	..	..	..	117	107	224	
Typho-Malarial.....	2	1	..	..	..	1	..	1	..	..	1	1	2	1	2	..	..	..	1	3	1	..	..	..	..	1	..	..	8	9	17	
Fistula.....	1	..	1	1	..	1	..	1			
Gall Stones.....	1	1	1	2	2	2			
Gangrene.....	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	1	..	1	1	2	1	4	3	..	..	1	8	15
Senile.....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	..	2	2	4	
Gastritis, Acute.....	1	3	..	..	..	..	..	..	..	..	..	..	..	3	..	1	3	1	2	2	2	2	2	3	1	1	..	..	11	16	27	

[illegible]

CAUSES OF DEATH.

CAUSES OF DEATH.																																					
Under 1.				1 and under 2.		2 to 3.		3 to 5.		5 to 10.		10 to 15.		15 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 to 90.		90 and over.		Age not stated.		SEX.		Total.	
M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F		M	F

TABLE IX.—CLASSIFICATION AND PERCENTAGE, 1888.

Showing what part of the Mortality in the Whole State, and in each Division is ascribed to each cause and class of causes.

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.									PERCENTAGE OF DEATHS IN EACH DIVISION.							
CAUSES OF DEATH.									Percentage in the Whole State.							
Whole State.									Washington County.	Woonsocket.	Providence City.	Pawtucket.	Providence Towns.	Newport City.	Newport County.	Bristol County.
251 408	183 319	1 466 557	2 644 442	368	6 594	All Causes.....	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00
251 408	138 317	1 458 551	2 635 441	367	6 566	Causes Specified.....	99 58	99 73	99 78	99 66	99 45	98 92	99 45	99 37	99 28	100 00
.....	1 2	8 6	9 1	1	28	Causes not Specified.....	.42	.27	.22	.34	.55	1.08	.63	.63	.72	.....
CLASSES.																
67 113	23 70	391 121	653 137	69	1 654	I. ZYMOTIC DISEASES.....	25.08	18.75	31 00	24.69	26.67	23.51	26.67	21.94	16.53	26.69
49 83	15 38	232 90	531 95	82	1 215	II. CONSTITUTIONAL DISEASES	18.43	22.28	21.49	20.08	15.82	16.20	15.82	11.91	10 80	19.52
101 148	63 153	584 219	1 117 115	156	2 656	III. LOCAL DISEASES.....	40.28	42.39	26 02	42.25	39 83	39 31	39 83	47 96	45 31	40.24
28 55	25 47	186 96	222 76	48	783	IV. DEVELOPMENTAL DISEASES	11.85	13.04	17 20	8.32	12 69	17 20	12 69	14 73	18 00	11.16
6 9	13 11	73 21	121 19	13	286	V. VIOLENCE AND OTHERWISE	4.36	3.54	4.29	4.66	4.99	3.78	4.99	3.46	9 36	2.39
ORDERS.																
CLASS I.																
66 111	21 67	364 126	614 123	66	1 568	Miasmatic.....	23.77	17.94	30.12	23.22	24.82	22.61	24.82	21.00	15.09	26.29
1 2	1 1	21 1	15 2	2	46	Ethnetic.....	.70	.54	.44	.57	1.43	.18	1.43	.31	.72	.40
.....	1 2	6 4	23 2	1	39	Dietic.....	.59	.27	.44	86	.42	.72	.42	.63	.72	.....
.....	.....	.....	1	.....	1	Parasitic.....	.02	.....	.....	.04	.....	.....	.....	.....	.....	.....

CLASS II.																				
15	19	9	11	64	25	112	24	28	307	Diathetic.....	4.65	8.60	5.44	4.27	4.50	4.36	3.44	6.48	4.65	5.97
24	64	6	27	168	65	419	71	54	908	Tubercular.....	13.77	14.68	16.05	15.81	11.70	11.46	8.47	4.32	15.69	13.55
CLASS III.																				
39	55	17	41	192	54	309	43	53	803	Dis. of Nervous System.....	12.14	14.41	9.72	11.68	9.69	13.40	12.83	12.23	13.44	15.54
11	22	16	27	84	30	212	9	31	442	Dis. of Circulatory System.....	6.66	8.43	2.07	8.02	5.38	5.72	8.46	11.51	5.39	4.38
26	42	12	42	180	91	326	34	45	792	Dis. of Respiratory Organs.....	12.00	12.23	7.71	12.31	16.33	12.27	13.13	8.63	10.29	7.97
16	15	8	20	78	31	124	15	17	324	Dis. of Digestive Organs.....	4.90	4.62	3.35	4.71	5.57	5.32	6.30	5.75	3.68	6.37
12	10	9	20	38	12	128	6	9	244	Dis. of Urinary Organs.....	3.69	2.43	1.38	4.82	2.16	2.58	6.30	6.47	2.49	4.79
				2		8	1		11	Dis. of Reproductive Organs.....	.22		.22	.31		.14				
1			2	3	1	5			12	Dis. of Os. and Locomo. System.....	.24			.19	.18	.21	.63			.40
2	4	1	1	7		3	7	1	26	Dis. of Integumentary System.....	.39	.27	1.57	.11		.49	.31	.72	.98	.79
						2			2	Dis. of Organs of Special Sense.....	.04			.07						
CLASS IV.																				
12	26	11	17	78	38	124	49	10	365	Develop. Dis. of Children.....	5.53	2.71	11.09	4.69	6.82	5.31	5.33	7.92	6.36	4.79
	8			10	5	12	2	1	33	Develop. Dis. of Women.....	.53	.27	.44	.45	.90	.70			.72	
16	26	14	27	77	47	78	22	35	342	Develop. Dis. of Old Age.....	5.62	9.52	4.99	2.87	8.40	5.25	8.46	10.08	6.36	6.37
			3	21	6	8	3	2	43	Develop. Dis. of Nutrition.....	.77	.54	.68	.31	1.08	1.43	.94			
CLASS V.																				
4	6	8	6	46	9	88	14	8	189	Accident and Neglect.....	2.87	2.19	3.17	3.39	1.62	3.14	1.89	5.76	1.50	1.60
				1		3	1		5	Homicide.....	.08			.11		.07				
	1	2	1	3	2	9	1	2	21	Suicide.....	.33	.54	.22	.35	.36	.21	.31	1.44	.25	
2	2	3	4	23	10	21	3	3	71	Otherwise.....	1.06	.81	.68	.81	1.80	1.57	1.26	2.16	1.50	.79
CLASS I.—ZYMOTIC.																				
<i>Order One.—Miasmatic Dis.</i>																				
18	35	4	24	119	40	149	60	18	467	Cholera Infantum.....	7.08	4.90	13.63	5.62	7.19	8.12	7.56	2.88	8.57	7.17
				8	5	15			39	Cholera Morbus.....	.47			.57	.90	.56	.63			
4	2			24	7	27	3	5	79	Group.....	1.19	1.36	.68	.99	1.26	1.64	2.18		.50	1.60
13	3		9	36	14	98	8	10	197	Diphtheria.....	2.86	2.72	1.84	3.78	2.52	2.44	2.80		.72	5.17

TABLE IX.—CLASSIFICATION AND PERCENTAGE, 1888.—Continued.

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.										PERCENTAGE OF DEATHS IN EACH DIVISION.										CAUSES OF DEATH.	Percentage in the Whole State.		
Bristol County.	Kent County.	Newport Towns.	Newport City.	Providence County Towns.	Pawtucket.	Providence City.	Woonsocket.	Washington County.	Whole State.	Washington County.	Woonsocket.	Providence City.	Pawtucket.	Providence County Towns.	Newport City.	Newport County Towns.	Kent County.	Bristol County.					
5	3	2	1	25	11	33	3	3	80	1.20	.81	1.28	1.96	1.71	...	...	72	1.99			
1	5	9	1	9	6	38	3	12	77	1.11	3.26	1.47	1.08	.63	.31	1.44	1.25	.40					
2	1	6	1	6	1	8	...	3	25	.37	.81	.31	.18	.42	.94	.72	.25	...					
...	2	4	3	4	3	5	...	4	22	.35	1.09	.19	.54	.28	.94	.72	.50	...					
...	...	...	...	...	2	2	...	...	4	.08	...	.07	.36	...	...	...	...	...
1	1	23	3	23	13	8	1	...	50	.75	...	.22	.36	...	...	...	...	...
20	23	43	7	43	7	102	6	9	224	3.36	2.43	.31	2.32	1.57	.94	...	.25	.40			
...	1	5	...	5	3	9	...	...	17	.25	...	3.82	1.26	2.93	2.18	5.04	5.64	7.97			
...	1	2	...	2	3	...	...	...	11	.22	...	.33	.36	.35	...	...	.25	...
1	...	2	...	2	3	...	...	...	7	.14	1.15	...	.54	.14	...	...	.25	...
...	2	3	...	3	1	2	3	...	11	.22	.45	...	.36	.14	...	...	.50	...
...	...	6	...	6	2	8	...	2	18	.27	.68	.07	.18	.21	...	...	...	...	
...	3	9	...	9	2	28	...	.54	18	.27	...	.31	.36	.42	.63	...	.72	...
...	...	...	...	...	...	2	...	.75	44	.68	...	1.08	.36	.63	.63	...	...	...		
1	29	6	4	40	5	80	42	...	207	3.11	...	.07	...	...	.63	...	...	...		
<i>Order Two.—Euthetic Dis.</i>																							
...	...	...	...	...	...	2	...	...	2	.04	...	.07	...	...	...	...	...	...
1	...	...	...	...	...	1	...	...	1	.02	...	.04	...	...	...	...	.25	...
...	1	...	...	1	...	...	...	...	2	.04	...	...	...	.07	...	...	.25	...
1	1	...	1	17	...	6	2	2	30	.47	.54	.44	.23	1.19	.31	...	.25	.40			
...	...	...	...	...	...	6	...	...	11	.22	...	.23	.18	.21	.72	...	...	...		

<i>Order Three.—Dietic Dis.</i>									
14 Alcoholism.....	1	3	1	9	.....	28	.....	33	.18
2 Delirium Tremens.....	1	1	.....	.....	.....	.04	.....	.....	.07
19 Inanition.....	1	1	2	13	1	.29	.27	.49	.36
4 Purpura and Scurvy.....	.....	1	1	1	1	.08	.....	.04	.18
<i>Order Four.—Parasitic Dis.</i>									
1 Worms, etc.....	.....	.....	.....	1	.....	.02	.....	.04	.....
CLASS II.—CONSTITUTIONAL.									
<i>Order One.—Diathectic Dis.</i>									
47 Dropsy.....	3	4	2	1	13	.....	1.64	2.75	.23
13 Anemia.....	1	1	1	5	2	.26	.....	.11	.36
91 Cancer, Various.....	5	8	5	4	19	7	2.99	.41	1.26
21 Cancer of Breast.....	.....	.....	5	3	11	1	.33	.27	.54
23 Cancer of Liver.....	2	.....	4	4	11	2	.37	.54	.42
35 Cancer of Stomach.....	2	1	1	1	4	.....	.57	.81	.41
23 Cancer of Uterus.....	.....	1	5	.....	15	1	.35	.22	.57
19 Mortification.....	3	3	1	3	2	.29	.54	.....	.36
35 Rheumatism.....	1	1	2	6	10	6	.52	.81	1.37
<i>Order Two.—Tubercular Dis.</i>									
45 Scrofula.....	1	5	.....	6	2	.68	.54	.44	.36
13 Tuberc Mesenterica.....	1	.....	4	.....	7	.20	.27	.....	.28
800 Phtisis (Pulmonalis) ..	28	55	6	26	362	66	12.13	13.55	10.23
30 Hydrocephalus.....	4	4	1	16	.....	.47	.....	.62	.18
20 Tubercular Meningitis.....	.....	.....	4	5	7	3	.31	.27	.90
CLASS III.—LOCAL.									
<i>Order One.—Dis. of the Nervous System.</i>									
130 Cephalitis.....	3	12	.....	7	23	8	1.95	1.64	2.34
3 Cerebritis.....	1	.....	.....	.....	1	1	.06	.22	.04
211 Apoplexy.....	10	15	5	6	39	15	3.16	5.42	3.64
156 Paralysis.....	19	11	8	10	35	4	2.34	3.54	1.55
43 Insanity.....	1	2	.....	.....	29	4	.64	.....	.27

TABLE IX.—CLASSIFICATION AND PERCENTAGE, 1888.—Continued.

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.										PERCENTAGE OF DEATHS IN EACH DIVISION.							
CAUSES OF DEATH.										Percentage in the Whole State.							
Whole State.										Washington County.	Woonsocket.	Providence City.	Pawtucket.	Providence Towns.	Newport City.	Newport Towns.	Bristol County.
1	1	1	1	1	1	1	1	1	1	.04	.27	.31	.18	.42	.31	.72	.40
...	...	...	...	...	...	...	...	...	...	.23	.27	.04	.36	.31	.26	.72	...
...	...	...	...	...	...	...	...	...	...	.18	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	2.81	1.91	2.50	2.16	2.44	3.12	.72	1.60
...	...	...	...	...	...	...	...	...	...	1.19	1.36	.99	1.63	1.64	.94	1.44	.40
1	6	2	3	2	3	2	3	2	5	...	...	...	...	...	...	...	...
<i>Order Two.—Diseases of the Circulatory System.</i>										...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	.37	...	.66	.18	...	1.26	...	...
...	...	...	...	...	...	...	...	...	...	.12	...	.07	...	.07	.31	...	...
11	22	14	22	9	31	29	192	2	18	6.19	8.43	7.29	5.20	5.65	6.89	10.08	4.38
<i>Order Three.—Diseases of the Respiratory Organs</i>										...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	.04	...	.04	.18	...	...	...	...
1	...	...	...	...	...	...	...	...	...	.14	...	.11	...	.21	...	...	.40
1	4	2	11	60	27	8	10	6	...	3.01	1.64	3.03	4.85	4.01	3.40	1.44	.98
2	...	1	3	7	5	8	1	...	...	.41	...	.31	.90	.49	.94	.72	.79
...	...	...	...	...	...	...	...	...	...	.27	.27	.35	.72	.14	.31	.72	...
16	37	8	21	99	49	219	23	36	...	7.62	9.79	8.28	8.78	6.75	6.60	5.75	6.38
...	...	...	...	...	...	...	...	...	...	.36	.54	.11	.54	.42	.94	...	...
...	...	...	...	...	...	...	...	...	...	.22	...	.11	.36	.21	.94	...	...

Order Four.—Diseases of the Digestive Organs.

37 Gastritis.....	3	1	5	7	1	19	1	.55	.22	.72	.18	.49	1.58	.72	.25	.79
85 Enteritis.....	3	4	3	23	7	33	7	1.32	1.09	1.26	1.26	1.57	1.26	2.16	.93	1.20
60 Peritonitis.....	6	4	5	12	4	23	3	.90	.81	.68	.87	.84	1.58	.98	.98	2.38
1 Ascites.....	1	1	1	1	1	1	1	.02	.....	.....	.....	.....	.....	.....	.....	.....
3 Ulceration of Intestines.....	1	1	1	2	1	1	1	.05	.....	.04	.....	.14	.....	.....	.....	.....
11 Hernia.....	1	1	1	1	1	6	1	.22	.27	.23	.18	.07	.31	.....	.....	.40
22 Ileus.....	1	1	1	5	3	6	1	.31	1.36	.22	.54	.35	.....	.72	.....	.40
3 Intussusception.....	1	1	1	1	1	2	1	.06	.....	.07	.....	.....	.....	.....	.....	.40
1 Fistula.....	1	1	1	1	1	1	1	.02	.....	.04	.....	.....	.....	.....	.....	.....
24 Stomach Diseases.....	1	1	1	10	4	5	1	.35	.27	.22	.19	.72	.31	.....	.25	.40
3 Hepatitis.....	1	1	2	1	1	1	1	.06	.....	.....	.18	.....	.63	.....	.....	.....
12 Jaundice.....	1	1	2	4	1	5	1	.24	.....	.19	.....	.28	.....	1.44	.....	.40
53 Liver Diseases.....	1	5	2	12	10	21	1	.89	.54	.22	1.79	.....	.63	.....	1.25	.....
1 Spleen Diseases.....	1	1	1	1	1	1	1	.02	.....	.80	.....	.07	.....	.....	.....	.....
5 Bowel Diseases.....	1	1	1	1	1	2	1	.10	.27	.22	.07	.07	.....	.....	.....	.....

Order Five.—Diseases of the Urinary Organs.

42 Nephritis.....	1	2	1	7	3	23	3	.66	.....	.70	.87	.54	.31	1.44	.50	.40
150 Nephria (Bright's Disease).....	9	3	15	19	6	81	1	2.25	1.64	.22	3.04	1.08	1.30	3.60	2.00	3.59
13 Diabetes.....	1	1	2	3	1	6	1	.21	.....	.22	.23	.21	.63	.72	.....	.....
1 Calculus (Gravel, &c).....	1	1	1	1	1	1	1	.02	.....	.04	.....	.....	.....	.....	.....	.....
10 Cystitis.....	1	1	1	2	2	6	1	.20	.....	.23	.....	.14	.....	.72	.....	.40
4 Prostate, Disease of.....	1	1	1	3	1	1	1	.08	.....	.....	.....	.21	.31	.....	.....	.....
21 Kidney Diseases.....	1	1	1	4	3	11	2	.33	.54	.42	.54	.28	.31	.....	.....	.....
3 Bladder, Diseases of.....	1	1	1	1	1	1	1	.06	.27	.22	.....	.....	.....	.....	.....	.40

Order Six.—Diseases of the Gen-erative Organs. Female.

5 Ovarian Dropsy.....	1	1	1	1	1	3	1	.10	.....	.22	.11	.....	.....	.....	.....	.....
6 Diseases of Uterus.....	1	1	1	1	1	5	1	.12	.....	.20	.....	.07	.....	.....	.....	.....

Order Seven.—Oseous and Loco-motory System.

2 Bones, Diseases of.....	1	1	1	1	1	1	1	.04	.....	.04	.....	.07	.....	.....	.....	.....
1 Joint Diseases.....	1	1	1	1	1	1	1	.02	.....	.04	.....	.....	.....	.....	.....	.....
9 Vertebrae, Diseases of.....	1	1	2	2	1	3	1	.18	.....	.10	.18	.14	.63	.....	.....	.40

TABLE IX.—CLASSIFICATION AND PERCENTAGE, 1888.—Continued.

NUMBER OF DEATHS IN EACH DIVISION OF THE STATE.								CAUSES OF DEATH.	Percentage in the Whole State.	PERCENTAGE OF DEATHS IN EACH DIVISION.																
Bristol County.	Kent County.	Newport County Towns.	Newport City.	Providence County Towns.	Pawtucket.	Providence City.	Woonsocket.			Washington County.	Woonsocket.	Providence City.	Pawtucket.	Providence County Towns.	Newport City.	Newport County Towns.	Kent County.	Bristol County.								
1	3	...	...	6	...	2	6	1	<i>Order Eight.—Integumentary System.</i>							.29	.27	1.35	.07	...	.42	...	...	...	.72	.40
1	1	1	1	1	...	1	1	...	<i>19 Phlegmon</i>							.14	...	.22	.04	...	.07	.31	.72	.25	.40	
...	...	...	...	...	...	...	...	...	<i>7 Skin Diseases</i>							...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	<i>Order Nine.—Organs of Special Sense. Eye and Ear.</i>							.04	...	...	.07	...	...	...	...	...	...	...
...	...	...	...	...	...	2	...	...	<i>2 Otitis.</i>							...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	CLASS IV.—DEVELOPMENTAL.							...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	<i>Order One.—Developmental Diseases of Children.</i>							...	...	...	...	...	...	...	...	...	...	...
7	15	5	2	36	11	16	36	9	<i>134 Debility, Infantile.</i>							2.01	1.64	8 15	.63	1.96	2.44	.63	3.60	3.68	2.80	
...	6	1	7	14	15	53	...	...	<i>96 Debility, Premature Birth.</i>							1.32	...	...	2.00	2.70	.98	2.20	.72	1.50	...	
...	1	...	1	7	...	6	...	1	<i>16 Cyanosis</i>							.32	.27	...	.23	...	.49	.31	...	.25	...	
...	...	...	...	...	...	3	...	...	<i>4 Spina Bifida.</i>							.08	...	...	.11	...	...	.31	...	...	...	...
...	...	...	...	...	...	5	2	...	<i>16 Other Malformations.</i>							.32	...	.44	.20	.90	.21	.31	...	...	...	...
...	...	...	...	...	...	11	9	...	<i>35 Teething</i>							.57	...	2.06	.42	.54	.42	.31	.72	.50	.79	
2	2	1	1	6	3	11	9	...	<i>64 Innutrition.</i>							.96	...	.81	1.10	.72	.84	1.26	2.88	.50	1.20	
...	...	...	...	...	...	30	2	...	<i>Order Two.—Developmental Diseases of Women.</i>							...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	12	2	1	<i>33 Childbirth.</i>							.53	.27	.44	.45	.90	.70	...	...	...	.72	...

TABLE X.—OCCUPATIONS AND AGES AT DEATH, 1888.
*Showing the Number, the Aggregate and the Average Ages at Death
of the Decedents in the several Occupations, Ages under
Twenty being excluded.*

OCCUPATIONS.	STATE OF RHODE ISLAND.		
	Number of Deaths.	Aggregate Age.	Average Age.
I.			
TILLERS OF THE SOIL.			
Farmers.....	181	12,550	69.34
Florists.....	1	51	51.00
Gardeners.....	9	526	58.44
	191	13,127	68.73
II.			
PROFESSIONAL.			
Actors.....	1	30	30.00
Artists.....	3	222	74.00
Authors.....	1	71	71.00
Civil Engineers.....	2	102	51.00
Clergymen.....	8	458	57.38
Dentists.....	1	38	38.00
Inventors.....	1	73	73.00
Journalists.....	3	175	58.33
Lawyers.....	4	166	41.50
Musicians.....	2	119	59.50
Photographers.....	1	20	20.00
Physicians.....	9	460	51.11
Policemen.....	4	225	56.25
Public Officers.....	3	202	67.33
Sheriffs and Constables.....	3	196	65.33
Students.....	3	65	21.67
Teachers.....	4	260	65.00
Telegraph and Telephone Operators....	1	22	22.00
	54	2,904	53.78
III.			
OPTIONAL ACTIVITY.			
Agents.....	10	537	53.70
Bankers and Brokers.....	6	335	55.83
Bank Officers.....	6	411	68.50
Collectors.....	2	128	64.00

TABLE X.—OCCUPATIONS, 1888.—Continued.

OCCUPATIONS.	STATE OF RHODE ISLAND.		
	Number of Deaths.	Aggregate Age.	Average Age.
Contractors and Builders.....	4	209	52.25
Druggists.....	3	94	31.33
Grocers.....	10	550	55.00
Hotel Keepers.....	3	161	53.67
Junk Dealers.....	3	184	61.33
Manufacturers.....	15	1,622	60.88
Marketmen.....	4	270	67.50
Merchants.....	29	1,916	66.07
Optician.....	1	69	69.00
Railroad Officials.....	8	289	36.13
Saloon Keepers.....	5	200	40.00
Stable Keepers.....	1	38	38.00
Traders, Dealers, etc.....	32	1,707	53.34
Undertakers.....	2	104	52.00
IV.	144	8,824	61.28
OUTDOOR.— <i>Local.</i>			
Carpenters and Joiners.....	63	3,583	56.87
Caulkers.....	1	79	79.00
Masons.....	30	1,739	57.97
Millwrights.....	1	69	69.00
Pavers.....	1	70	70.00
Riggers.....	2	100	50.00
Sash and Blind Makers.....	1	71	71.00
Ship Carpenters.....	3	195	65.00
Stone Cutters and Marble Workers.....	8	435	54.38
Tanners and Curriers.....	2	88	44.00
Wheelwrights.....	5	274	54.80
	117	6,703	57.29
V.			
INDOOR.— <i>Active.</i>			
Bakers.....	5	283	56.60
Belt Makers.....	1	73	73.00
Blacksmiths.....	22	1,074	48.82
Bleachers.....	4	191	47.75
Bobbin Makers.....	1	60	60.00
Boiler Makers.....	2	68	34.00

TABLE X.—OCCUPATIONS, 1888—Continued.

OCCUPATIONS.	STATE OF RHODE ISLAND.		
	Number of Deaths.	Aggregate Age.	Average Age.
Bolt Makers.....	1	62	62.00
Brewers.....	1	25	25.00
Brush Makers.....	2	111	55.50
Cabinet Makers.....	3	170	56.67
Carriage Makers and Trimmers.....	3	142	47.33
Caterers ...	1	34	34.00
Cooks	2	86	43.00
Coopers.....	4	282	70.50
Die Sinkers.....	1	36	36.00
Dyers.....	6	388	64.67
Foundrymen.....	1	40	40.00
Gas Fitters, etc.....	1	65	65.00
Gun and Locksmiths.....	1	70	70.00
Iron Workers.	1	52	52.00
Machinists.....	36	1,757	48.81
Mechanics.....	7	279	39.43
Miners	1	64	64.00
Moulders.....	9	385	42.78
Painters and Glaziers....	39	1,926	49.38
Paper Hangers.....	1	50	50.00
Pattern Makers.....	2	92	46.00
Plasterers and Stucco Workers....	2	88	44.00
Platers	1	76	76.00
Plumbers	4	162	40.50
Steam Pipers	1	56	56.00
Stopper Makers.....	1	22	22.00
Superintendents and Overseers.....	10	560	56.00
Tinsmiths.....	3	127	42.33
Tool Makers.....	2	71	35.50
Upholsterers.....	3	114	38.00
Wood Finishers.....	1	42	42.00
Wood Turners.....	2	102	51.00
	188	9,285	49.36
VI.			
INDOOR.— <i>Activity Restricted.</i>			
Bartenders.....	1	33	33.00
Barbers.....	8	282	35.25
Basket Makers.....	1	71	71.00

TABLE X.—OCCUPATIONS, 1888.—Continued.

OCCUPATIONS.	STATE OF RHODE ISLAND.		
	Number of Deaths.	Aggregate Age.	Average Age.
Bookkeepers.....	10	434	43.40
Card Grinders.....	1	59	59.00
Chain Makers.....	2	118	59.00
Chasers.....	1	45	45.00
Cigar Makers.....	3	148	49.33
Clerks and Salesmen.....	50	1,726	34.52
Enamellers.....	1	64	64.00
Engravers.....	1	41	41.00
File Cutters.....	4	184	46.00
Finishers.....	1	57	57.00
Heaters.....	1	44	44.00
Jewelers.....	40	1,475	36.88
Laundrymen.....	1	33	33.00
Millers.....	1	67	67.00
Operatives.....	93	4,286	46.09
Polishers.....	4	186	46.50
Printers.....	7	330	47.14
Roll Coverers.....	2	105	52.50
Rubber Workers.....	7	239	34.14
Saddlers and Harnessmakers.....	1	33	33.00
Sail Makers.....	1	43	43.00
Shoemakers.....	17	995	58.53
Silversmiths.....	4	218	54.50
Tailors.....	15	610	40.67
Watchmakers.....	1	32	32.00
Wool Sorters.....	2	129	64.50
	281	12,087	43.01
VII.			
OCCUPATIONS AT LARGE.			
Boatmen.....	4	244	61.10
Brakemen.....	3	90	30.00
Butchers.....	3	102	34.00
Car Drivers, etc.....	2	78	39.00
Coachmen.....	7	298	42.57
Engineers and Firemen.....	21	1,061	50.52
Expressmen.....	4	270	67.50
Fishermen and Oystermen.....	2	100	50.00
Lumbermen.....	1	87	87.00

TABLE X.—OCCUPATIONS, 1888.—Continued.

OCCUPATIONS.	STATE OF RHODE ISLAND.		
	Number of Deaths.	Aggregate Age.	Average Age.
Naval Officers.....	1	53	53.00
Peddlers.....	7	339	48.43
Pilots.....	3	206	68.67
Sailors.....	15	786	52.40
Sea Captains.....	6	373	62.17
Teamsters.....	27	1,390	51.48
	106	5,477	51.67
VIII.			
NO SPECIAL TRADES.			
Cab Drivers, Hackmen, etc.....	3	147	49.00
Gentlemen.....	5	353	70.60
Hostlers.....	5	225	45.00
Janitors.....	10	508	50.80
Laborers.....	334	17,098	51.16
Lamp Lighters.....	1	28	28.00
Messengers.....	1	29	29.00
Porters.....	2	93	46.50
Servants.....	2	68	34.00
Watchmen.....	6	357	59.50
Waiters.....	3	131	43.67
Well Diggers.....	1	80	80.00
	373	19,117	51.23
IX.			
WOMEN.			
Artists.....	1	80	80.00
Basket Makers.....	2	149	74.50
Cigar Makers.....	2	63	31.50
Clerks and Saleswomen.....	1	47	47.00
Cooks.....	1	28	28.00
Domestics.....	7	309	44.14
Farming.....	1	89	89.00
Dressmakers.....	8	320	40.00
Housekeepers.....	260	14,595	56.11
Housewives.....	13	713	54.84
Jewelers.....	3	75	25.00

TABLE X.—OCCUPATIONS, 1888.—Continued.

OCCUPATIONS.	STATE OF RHODE ISLAND.		
	Number of Deaths.	Aggregate Age.	Average Age.
Laundresses	4	166	41.50
Laboring	2	49	24.50
Milliners	3	123	41.00
Nurses	5	281	56.20
Operatives	51	1,498	29.39
Physicians	2	116	58.00
Public Officers	1	65	65.00
Rubber Workers	4	118	29.50
Seamstresses	5	289	57.80
Servants	5	335	67.00
Tailoresses	4	113	28.25
Teachers	6	229	38.17
Waitresses	1	57	57.00
	392	19,907	50.78

TABLE X.—RECAPITULATION BY CLASSES.

OCCUPATIONS.	STATE OF RHODE ISLAND.		
	Number of Deaths.	Aggregate Age.	Average Age.
I.			
TILLERS OF THE SOIL.....	191	13,127	68.73
II.			
PROFESSIONAL SERVICES.....	54	2,904	53.78
III.			
OPTIONAL ACTIVITY.....	144	8,824	61.28
IV.			
OUTDOOR.— <i>Local</i>	117	6,703	57.29
V.			
INDOOR.— <i>Active</i>	188	9,285	49.36
VI.			
INDOOR.— <i>Activity Restricted</i>	281	12,087	43.01
VII.			
OCCUPATIONS AT LARGE.— <i>Active</i>	106	5,477	51.67
VIII.			
NO SPECIAL TRADES.....	373	19,117	51.23
IX.			
WOMEN.....	392	19,907	50.78
ALL CLASSES.....	1,846	97,431	52.78

TABLE XI.—OCCUPATIONS AND CAUSES OF DEATH, 1888—Continued.

OCCUPATIONS.	Whole Number.	Accidents.	Alcoholism.	Apoplexy and Paralysis.	Asthma.	Bladder, Diseases of.	Bowels, Diseases of.	Brain, Diseases of.	Bronchitis.	Cancer.	Consumption.	Debility.	Diabetes.	Diarrhoea and Dysentery.	Dropsy.	Enteritis.	Epilepsy.	Erysipelas.	Fever, Typhoid, etc.	Heart, Diseases of.	Insanity.	Kidney, Diseases of.	Liver, Diseases of.	Old Age.	Peritonitis.	Pleurisy.	Pneumonia & Cong. of Lungs.	Rheumatism.	Septicæmia.	Spine, Diseases of.	Stomach, Diseases of.	Suicide.	Tuberculosis.	
Moulders.....	6	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Painters and Glaziers.....	35	5	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Paper Hangers.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Pattern Makers.....	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Plasterers and Stucco Workers.	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Platers.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Plumbers.....	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Steam Pipers.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Superintendents and Overseers.	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Tinsmiths.....	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Tool Makers.....	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Upholsterers.....	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Wood Finishers.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Wood Turners.....	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
VI.	179	11	2	15	1	1	1	3	5	8	40	4	1	2	2	1	1	1	2	7	16	1	14	4	2	1	27	2	1	1	4	2	1	2
INDOOR—Activity Restricted.																																		
Bartenders.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Barbers.....	8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

OCCUPATIONS.

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OCCUPATIONS.	Whole Number.	Accidents.	Alcoholism.	Apoplexy and Paralysis.	Asthma.	Bladder, Diseases of.	Bowels, Diseases of.	Brain, Diseases of.	Bronchitis.	Cancer.	Consumption.	Debility.	Diabetes.	Diarrhea and Dysentery.	Dropsy.	Enteritis.	Epilepsy.	Erysipelas.	Fever, Malarial.	Fever, Typhoid, etc.	Heart, Diseases of.	Insanity.	Kidney, Diseases of.	Liver, Diseases of.	Old Age.	Peritonitis.	Pleurisy.	Pneumonia & Cong. of Lungs.	Rheumatism.	Septicæmia.	Spine, Diseases of.	Stomach, Diseases of.	Suicide.	Tuberculosis.		
Bookkeepers.....	8							1			2												2	1		1		1								
Chain Makers.....	2																																			
Chasers.....	1																				1															
Cigar Makers.....	2					1					1																									
Clerks and Salesmen.....	49		1	2		3	1	2	1	17								1	1	6	5		2						2							
Enamellers.....	1																																			
Engravers.....	1										1																									
File Cutters.....	4						1	1		2																										
Finishers.....	1																						1													
Harnessmakers and Saddlers.....	1																						1													
Jewelers.....	38	4		1						1	16	1		3						2	1	1	4		1		1		2	1						
Laundrymen.....	1																																			
Millers.....	1		1																										1							
Operatives.....	84	3	1	3	1	1	2	3	3	1	22	5	1	2						2	1	8		5	3	1	1	2	9				2	1	1	
Polishers.....	4									1	2																									
Printers.....	7																				1															
Roll Covers.....	2																																			
Rubber Workers.....	6										6																									
Sail Makers.....	1																																			
Shoemakers.....	15			1			1	1			1	1									3		1	1	2	1							1	1		

TABLE XI.—OCCUPATIONS AND CAUSES OF DEATH, 1888—Continued.

OCCUPATIONS.	IX.																																																										
	WOMEN.																																																										
Whole Number.	Accidents.	Alcoholism.	Apoplexy and Paralysis.	Asthma.	Bladder, Diseases of.	Bowels, Diseases of.	Brain, Diseases of.	Bronchitis.	Cancer.	Consumption.	Debility.	Diabetes.	Diarrhea and Dysentery.	Dropsy.	Enteritis.	Epilepsy.	Erysipelas.	Fevers, Malarial.	Fevers, Typhoid, etc.	Heart, Diseases of.	Insanity.	Kidney, Diseases of.	Liver, Diseases of.	Old Age.	Peritonitis.	Pleurisy.	Pneumonia & Cong. of Lungs.	Rheumatism.	Septicæmia.	Spine, Diseases of.	Stomach, Diseases of.	Suicide.	Tuberculosis.																										
	2	5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2																										
Servants.....	2																		1									1																															
Watchmen.....	5									1									1	1								2																															
Waiters.....	2																			1								1																															
356																													26	2	26	3	1	7	6	10	11	73	12	5	2	6	3	9	22	37	1	7	4	20	3	48	2	8	2	2	4	2	2
Artists.....	1												1																																														
Basket Makers.....	2					2																																																					
Cigar Makers.....	2									2																																																	
Clerks and Saleswomen.	1														1																																												
Cooks.....	2																											1	1																														
Domestics.....	7									2			1		1			1									2																																
Farming.....	1		1																																																								
Dressmakers.....	7									2									1																																								
Housekeepers.....	237	1	2	21	2	6	4	10	9	42	14	1	5	5	1	1	1	6	5	31	1	7	4	20	3	28	2	1	1	5																													
Housewives.....	13	1							1	2	1		1							3				2		1	1																																

OCCUPATIONS.	Whole Number.	Accidents.																				Tuberculosis.										
		Alcoholism.	Apoplexy and Paralysis.	Asthma.	Bladder, Diseases of.	Bowels, Diseases of.	Brain, Diseases of.	Bronchitis.	Cancer.	Consumption.	Debility.	Diabetes.	Diarrhea and Dysentery.	Dropsy.	Enteritis.	Epilepsy.	Erysipelas.	Fever, Malarial.	Fever, Typhoid, etc.	Heart, Diseases of.	Insanity.		Kidney, Diseases of.	Liver, Diseases of.	Old Age.	Peritonitis.	Pleurisy.	Pneumonia & Cong. of Lungs.	Rheumatism.	Septicæmia.	Spine, Diseases of.	Stomach, Diseases of.	Suicide.
Jewelers	3	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	2	..	..	2	..	..	..	..	..	..	..	..	..
Laundresses	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	2	..	..	..	..	..	1	..	..	..	..
Milliners	3	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Nurses.....	5	1	..	..	..	..	..	..	..	2	2	1	1	1	1	..	..	..	4	2	2	2	..	..	..	..	..	..	..	..	..	..
Operatives	50	1	..	..	..	..	..	3	3	2	2	1	1	1	1	..	..	..	..	2	1	1	1	1	1	1	1	1	1	1	1	1
Physicians.....	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..
Public Officers	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Rubber Workers.....	3	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..
Seamstresses.....	9	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	1	1	1	1	1	1	1	1	1	1
Servants.....	4	1	..	1	..	..	..	..	1	1	1	..	..	..	..	..	..	..	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Tailoresses.....	4	1	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Teachers.....	6	..	..	..	..	..	..	..	2	..	..	1	1	1	1	..	..	..	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Waitresses.....	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	365	4	22	3	..	8	5	13	16	77	18	1	8	8	5	1	1	6	45	1	14	4	22	5	2	39	4	2	..	6	..	..

TABLE XI Continued.—OCCUPATIONS AND CAUSES OF DEATH, 1888.—RECAPITULATION BY CLASSES.

OCCUPATIONS.	Whole Number.	Accidents.	Alcoholism.	Apoplexy and Paralysis.	Asthma.	Bladder, Diseases of.	Bowels, Diseases of.	Brains, Diseases of.	Bronchitis.	Cancer.	Consumption.	Debility.	Diabetes.	Diarrhoea and Dysentery.	Dropsy.	Enteritis.	Epilepsy.	Erysipelas.	Fevers, Malarial.	Fevers, Typhoid, etc.	Heart, Diseases of.	Insanity.	Kidney, Diseases.	Liver, Diseases of.	Old Age.	Peritonitis.	Pleurisy.	Pneumonia & Cong. of Lungs.	Rheumatism.	Septicæmia.	Spine, Diseases of.	Stomach, Diseases of.	Suicide.	Tuberculosis.
I.																																		
TILLERS OF THE SOIL.....	177	6	17	2	4	7	2	8	14	3	5	4	1	4	2	5	24	8	2	27	3	92	1	2	4	1	3	22	1	1	2	4	1	1
II.																																		
PROFESSIONAL SERVICES.....	52	1	10	1	1	1	1	3	7	1	1	1	1	1	1	2	12	4	2	1	1	3	1	1	1	1	1	3	1	1	1	1	2	1
III.																																		
OPTIONAL ACTIVITY.....	151	8	117	1	2	1	3	4	7	23	2	1	4	2	3	1	5	16	2	11	6	3	21	2	1	2	1	21	2	1	2	3	1	1
IV.																																		
OUTDOOR.— <i>Localized</i>	116	12	213	3	3	3	8	15	2	1	1	1	1	1	1	3	1	5	16	6	1	4	1	1	12	2	1	12	2	1	1	1	1	1
V.																																		
INDOOR.— <i>Active</i>	179	11	215	1	1	3	5	8	40	4	1	2	2	1	1	2	7	16	14	4	2	1	27	2	1	4	2	27	2	1	4	2	1	1

OCCUPATIONS.	Whole Number.	Accidents.	Alcoholism.	Apoplexy and Paralysis.	Asthma.	Bladder, Diseases of.	Bowels, Diseases of.	Brain, Diseases of.	Bronchitis.	Cancer.	Consumption.	Debility.	Diabetes.	Diarrhea and Dysentery.	Dropsy.	Enteritis.	Epilepsy.	Erysipelas.	Fever, Malarial.	Fever, Typhoid, etc.	Heart, Diseases of.	Insanity.	Kidney, Diseases of.	Liver, Diseases of.	Old Age.	Peritonitis.	Pleurisy.	Pneumonia & Cong. of Lungs.	Rheumatism.	Septicæmia.	Spine, Diseases of.	Stomach, Diseases of.	Suicide.	Tuberculosis.	
VI.																																			
INDOOR.— <i>Activity Restricted</i>	260	11	2	11	1	2	6	7	8	4	18	7	1	3	2	4	1	1	3	13	22	1	20	6	5	4	3	24	1	...	3	4	2		
VII.																																			
OCCUPATIONS AT LARGE...	102	11	2	7	..	2	..	2	3	5	13	1	...	..	..	..	..	1	4	7	8	1	9	1	4	..	2	13	1	1	...	..	..	4	
VIII.																																			
NO SPECIAL TRADES.....	356	26	2	26	3	1	7	6	10	11	73	12	..	5	2	6	..	3	9	22	37	1	7	4	20	..	3	48	2	..	2	4	2	2	
IX.																																			
WOMEN.....	365	4	2	27	3	..	8	5	13	16	77	18	1	8	8	5	1	1	6	16	47	1	14	4	22	5	2	39	4	2	..	6	...		
ALL CLASSES.....	1758	89	14	143	8	11	30	34	48	70	340	50	4	28	21	20	5	13	29	82	198	6	93	24	90	17	11	209	14	6	2	22	17	10	

OCCUPATIONS.

OCCUPATIONS.	Whole Number.	Abscess.	Aneurysm	Bones, Diseases of.	Calculus.	Diphtheria.	Fistula.	Gangrene.	Goutre.	Hæmoptysis.	Hæmorrhage.	Hæmorrhage of Gums.	Hæmorrhoids.	Herula.	Homicide.	Influenza.	Laryngitis.	Lungs, Oedema of.	Malignant Pusule.	Prostate Disease.	Pyæmia.	Scarlatina.	Skin Diseases.	Tetanus.	Syphilis.	Tumors.	
Painters.	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..
Pavers.	1	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pilots.	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
Railroad Officials.	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Tailors.	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Teachers.	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Teamsters.	2	1	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Waiters.	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	59	9	4	1	1	3	1	3	1	4	1	1	1	2	2	1	1	2	3	3	3	3	2	1	4	1	4

OTHER DISEASES.—FEMALES.

OCCUPATIONS.	Whole Number.	Child Birth.	Diphtheria.	Fever.	Gangrene.	Hæmoptysis.	Hæmorrhage.	Ovarian Tumor.	Pelvic Abscess.	Puerperal Fever.	Scrofula.	Shock.	Tumor.	Tumor of the Throat.
Dressmakers.....	1	..	..	1	..	..	..	..	..	..	..	..	..	..
Housekeepers.....	22	6	1	..	1	1	2	2	1	5	1	1	..	1
Housewives.....	1	1	..	..	..	..	..	..	..	..	..	..	..	..
Laboring.....	1	..	..	..	..	..	..	..	..	1	..	..	..	..
Operatives.....	1	..	..	..	..	..	..	..	..	..	..	..	1	..
	26	7	1	1	1	1	2	2	1	6	1	1	1	1

RECAPITULATION.

Number of Other Diseases..... 85

Number of Occupations and Diseases of Decedents in Table XI. 1,758

Whole Number of Occupations of Decedents known..... 1,843

RESULTS AND OBSERVATIONS.

The number of births registered in the State of Rhode Island, during the year 1888, was seven thousand eight hundred and forty (7840); the number of marriages, three thousand and twenty-two (3,022); and the number of deaths, six thousand five hundred and ninety-four (6,594).

TABLE XII.

Presenting the General Results of Registration in the State during ten years, 1854-1863, and during each of the last twenty-five years.

Ten Years,	Whole Number of Births.	Still-born.	Living Births.	Marriages.	Deaths.
1854-1863.....	38,042.....	1,471.....	36,571.....	14,943.....	24,230
1864.....	3,892.....	138.....	3,754.....	1,844.....	3,360
1865.....	3,955.....	177.....	3,778.....	1,696.....	3,405
1866.....	4,902.....	172.....	4,730.....	2,318.....	2,970
1867.....	5,127.....	163.....	4,964.....	2,344.....	2,889
1868.....	5,372.....	212.....	5,160.....	2,285.....	2,912
1869.....	5,245.....	220.....	5,025.....	2,289.....	3,382
1870.....	5,215.....	234.....	4,981.....	2,362.....	3,238
1871.....	5,678.....	223.....	5,455.....	2,336.....	3,344
1872.....	6,143.....	202.....	5,941.....	2,537.....	4,247
1873.....	6,022.....	228.....	5,794.....	2,630.....	4,403
1874.....	6,466.....	277.....	6,189.....	2,541.....	4,229
1875.....	6,508.....	246.....	6,262.....	2,485.....	4,317
1876.....	6,329.....	224.....	6,105.....	2,253.....	4,116
1877.....	6,235.....	242.....	5,993.....	2,282.....	4,450
1878.....	6,714.....	248.....	6,466.....	2,324.....	4,441
1879.....	6,350.....	216.....	6,134.....	2,396.....	4,472
1880.....	6,295.....	192.....	6,103.....	2,769.....	4,829
1881.....	6,761.....	264.....	6,497.....	2,750.....	5,016
1882.....	6,825.....	253.....	6,572.....	2,634.....	5,074
1883.....	7,046.....	253.....	6,793.....	2,611.....	5,282
1884.....	7,305.....	272.....	7,033.....	2,558.....	5,141
1885.....	7,028.....	271.....	6,757.....	2,488.....	5,389
1886.....	7,621.....	293.....	7,328.....	2,750.....	5,849
1887.....	7,668.....	276.....	7,392.....	2,839.....	6,340
1888.....	7,840.....	295.....	7,545.....	3,022.....	6,594

During the period of thirty-five years there were recorded, in Rhode Island, 192,584 births, of which number 7,687 were still-born, and 184,897 were living children.

During the same period there were recorded 76,485 marriages, or 152,970 persons married, and 133,919 deaths.

These results show that in every 25.1 births there was one still-born child, or that in every 1,000 births there were about 40 still-born and 960 living children.

The same results also show that the ratio of whole number of living births to the whole number of persons married, and to the whole number of decedents, each during the same period, were as follows:

	Married.	Deaths.
For every 100 living births there were.....	82.8 and.....	72.4

There were 172 more births during 1888 than in the previous year. There were only 47 more in 1887 than there were in 1886. The number of marriages was 183 more than in 1887, and 272 more than in 1886. The deaths in 1888 exceeded in number those in 1887 by 254, and the number in 1886 by 745.

TABLE XIII.

Comparative exhibit of Births, Marriages and Deaths in each town in Rhode Island, in each of the five years 1884—1888, and excess of Births over the Deaths in 1888.

TOWNS AND DIVISIONS OF THE STATE.	BIRTHS.				MARRIAGES.						DEATHS.						Excess of Births over Deaths, 1888.
	1884.	1885.	1886.	1887.	1888.	1884.	1885.	1886.	1887.	1888.	1884.	1885.	1886.	1887.	1888.		
Barrington.....	20	27	29	18	27			5	6	12	16	17	29	20	20	7	
Bristol.....	131	111	123	116	100	33	32	40	36	23	113	98	116	119	127	-27	
Warren.....	108	71	90	94	87	35	30	34	33	39	72	70	78	78	104	-17	
BRISTOL COUNTY.....	259	209	242	228	214	79	69	79	75	74	201	185	223	217	251	-37	
Coventry.....	95	72	108	95	103	19	31	39	22	33		72	76	67	81	22	
East Greenwich.....	56	71	47	71	73	29	26	32	31	26	39	72	49	41	69	4	
West Greenwich.....	18	23	14	22	20	4	2	2	5	1	18	12	14	9	14	6	
Warwick.....	335	286	336	322	362	108	109	114	127	126	136	199	245	223	241	118	
KENT COUNTY.....	504	452	505	510	558	160	168	187	185	189	275	255	387	343	408	150	
James-town.....	10	9	9	6	2	1	.....	1	4	3	10	8	4	11	8	-6
Little Compton.....	9	15	16	7	4	11	15	4	9	5	16	16	22	14	13	-9	
Middletown.....	33	14	29	33	29	2	2	3	6	5	14	17	21	15	22	7	
Newport City.....	570	529	600	632	599	134	147	131	123	125	274	267	369	313	319	240	
New Shoreham.....	31	25	36	24	16	12	6	13	13	14	21	28	16	22	21	-5	
Portsmouth.....	29	27	21	26	23	5	7	14	9	10	29	32	25	17	24	-1	
Tiverton.....	53	68	55	79	63	23	13	16	11	22	41	43	41	49	51	12	
NEWPORT COUNTY.....	735	687	766	807	736	188	185	190	175	181	408	411	438	441	458	240	

Excess of Births
over Deaths, 1888.

TABLE XIII.—Continued.

TOWNS AND DIVISIONS OF THE STATE.	BIRTHS.					MARRIAGES.					DEATHS.					Excess of Births Over Deaths, 1888.
	1884.	1885.	1886.	1887.	1888.	1884.	1885.	1886.	1887.	1888.	1884.	1885.	1886.	1887.	1888.	
Burrillville.....	115	93	109	99	130	20	31	39	26	55	85	75	70	75	123	7
*Cranston.....	134	129	136	157	142	19	26	28	24	34	109	104	83	102	100	42
Cumberland.....	174	200	211	164	208	62	58	43	72	77	158	176	189	140	177	31
East Providence.....	154	157	181	131	175	45	39	68	55	67	105	113	99	96	120	55
Foster.....	17	16	20	20	19	13	16	11	12	9	24	29	24	33	19	0
Glocester.....	39	47	52	43	42	20	13	14	7	10	31	30	36	39	39	3
Johnston.....	170	167	154	140	197	26	35	30	26	33	83	91	128	172	161	36
Lincoln.....	401	381	540	595	602	160	105	110	114	155	283	335	416	413	434	168
North Providence.....	24	23	29	30	35	3	5	9	7	3	16	19	17	22	38	-3
North Smithfield.....	74	61	52	70	60	22	13	27	23	25	36	35	35	36	42	18
Pawtucket City.....	557	530	558	620	648	197	254	253	316	300	353	434	470	553	557	91
Providence City.....	2,956	2,936	2,960	2,963	3,053	1,114	1,091	1,349	1,254	1,349	2,333	2,164	2,353	2,610	2,644	409
Scituate.....	69	67	58	54	54	47	32	36	50	40	58	78	62	59	55	-1
Smithfield.....	62	36	66	35	43	14	17	26	16	16	24	32	22	27	53	-10
Woonsocket.....	447	414	523	541	535	157	147	161	163	174	282	304	372	444	442	93
PROVIDENCE COUNTY.....	5,393	5,257	5,649	5,662	5,943	1,929	1,882	2,109	2,215	2,361	43,975	4,019	4,376	4,851	5,004	939
Charlestown.....	25	10	18	16	8	12	9	8	2	6	16	18	9	21	19	-11
Exeter.....	20	13	16	13	13	11	9	10	8	18	18	19	17	18	11	2
Hopkinton.....	52	50	45	56	47	29	22	26	44	31	24	37	50	32	50	-1
Narragansett.....	80	70	79	82	21	33	20	21	23	8	50	52	48	80	16	5
North Kingstown.....	73	104	107	111	77	39	47	49	45	45	52	70	78	62	59	12
South Kingstown.....	27	42	44	36	29	10	9	8	3	6	16	23	30	33	26	3
Richmond.....	137	134	150	147	111	48	63	68	64	73	106	94	105	105	118	7
Westerly.....	414	423	459	461	389	172	179	190	189	214	282	213	337	351	368	21
WASHINGTON COUNTY.....	414	423	459	461	389	172	179	190	189	214	282	213	337	351	368	21
STATE INSTITUTIONS.....	7,305	7,028	7,621	7,668	7,840	2,558	2,488	2,750	2,889	3,022	5,141	5,389	5,849	6,340	6,594	-105
WHOLE STATE.....	7,305	7,028	7,621	7,668	7,840	2,558	2,488	2,750	2,889	3,022	5,141	5,389	5,849	6,340	6,594	1,246

* Exclusive of deaths in State Institutions.

† Including State Institutions.

The variations in the number of births, marriages and deaths, in the different towns and in the same town, during each of the five years from 1884 to 1888, may be readily seen in Table XIII.

In some towns it will be remarked that the proportional number of births is larger. This is particularly the case where there are manufacturing villages, and in cities. The births in Bristol county have somewhat diminished during the last half decade; increased in Kent, but remaining nearly the same in Newport county. The city of Newport gives between 500 and 600 births for each of the past five years. In 1887 the number was considerably more than the average. Providence county shows a gradual increase; Providence city little or no variation until 1888; there was a falling off in Washington county during the last four years.

In regard to the number of marriages, for the year 1888, similar variations have occurred. In Bristol and Newport counties the general average has been preserved. In Kent, Washington and Providence counties there has been a gradual increase. In the cities of Providence, Woonsocket and Pawtucket there was a gradually increasing number of marriages since 1884; in Newport city, on the other hand, a diminution since 1885. The number of marriages in Providence city, for 1883, was 1,777. This number has not since been reached by several hundred.

Bristol county shows nearly twenty-five per cent. more deaths than the average for the last five years. The other counties give a proportionate larger number. The mortality of the State has increased from two to three per cent, thus keeping pace with the growth of the population.

TABLE XIV.

Births, Marriages and Deaths in Rhode Island, in 1888, with the number of each in every 1,000 of the Population of each Town, and the Excess of the Births over the Deaths in every 1,000 of the Population.

TOWNS AND DIVISIONS OF THE STATE.	Population.*	Births.	Births per 1,000 of Population.	Marriages.	Persons married pr 1,000 of Popula- tion.	Deaths.	Deaths per 1,000 of Population.	Excess of Births over Deaths, per 1,000.
Barrington.....	1,400	27	19.3	12	17.1	20	14.3	5.0
Bristol.....	6,000	100	16.7	23	7.7	127	21.2	-4.5
Warren.....	4,400	87	19.8	39	17.7	104	23.6	-3.8
BRISTOL COUNTY.....	11,800	214	18.1	74	12.5	251	21.3	-3.2
Coventry.....	5,000	103	20.6	33	13.4	81	16.2	4.4
East Greenwich.....	2,800	73	26.1	26	18.5	69	24.6	1.5
West Greenwich.....	850	20	23.5	4	9.4	14	16.5	7.0
Warwick.....	14,018	362	25.8	126	17.9	244	17.4	8.4
KENT COUNTY.....	22,668	558	24.6	189	16.7	408	18.4	6.2
Jamestown ..	520	2	3.8	3	11.5	8	15.4	-11.6
Little Compton.....	1,050	4	3.8	5	9.4	13	12.4	-8.6
Middletown.....	1,205	29	24.1	5	8.3	22	18.3	5.8
Newport City.....	21,266	599	28.2	125	11.7	319	15.0	13.2
New Shoreham.....	1,312	16	12.2	14	21.4	21	16.0	-3.8
Portsmouth.....	2,000	23	11.5	10	10.0	24	12.4	-0.9
Tiverton.....	2,775	63	22.7	22	15.1	51	18.3	4.4
NEWPORT COUNTY.....	30,128	736	24.4	184	12.2	458	18.1	6.3
Burrillville.....	5,400	130	24.1	55	20.4	123	22.8	1.3
Cranston.....	5,000	142	28.4	34	13.6	100	20.0	8.4
Cumberland.....	7,263	208	28.6	77	21.2	177	24.4	5.2
East Providence.....	7,800	175	22.4	67	17.2	120	15.4	7.0
Foster.....	1,390	19	13.7	9	12.9	19	13.7	0.0
Glocester.....	2,100	42	20.0	10	9.5	39	18.6	1.4
Johnston.....	8,500	197	23.2	33	7.3	161	18.9	4.3
Lincoln.....	20,000	602	30.1	155	15.5	434	21.7	8.4
North Providence.....	1,550	35	22.6	3	3.0	38	24.5	-1.9
North Smithfield.....	3,160	60	18.1	25	15.8	42	13.3	4.8
Pawtucket.....	25,500	648	25.0	300	23.5	557	21.8	3.2
Providence City.....	125,000	3,053	24.4	1,349	21.6	2,644	21.0	3.4
Scituate.....	3,600	54	15.0	40	22.2	55	15.3	-0.3
Smithfield.....	2,500	43	17.2	30	12.0	53	21.2	-4.0
Woonsocket.....	20,000	535	26.8	174	17.4	442	22.1	4.7
PROVIDENCE COUNTY.....	238,763	5,943	24.9	2,361	19.8	5,004	21.0	3.9
Charlestown.....	1,050	8	7.6	6	11.4	19	18.1	-10.5
Exeter.....	1,050	13	12.4	18	34.2	11	10.5	1.9
Hopkinton.....	2,767	49	17.7	31	22.4	50	18.1	-0.4
Narragansett.....	1,000	21	21.0	8	16.0	16	16.0	5.0
North Kingstown.....	3,870	81	20.9	27	13.9	69	17.5	3.4
South Kingstown.....	4,600	77	16.7	45	19.6	59	12.8	3.9
Richmond.....	1,800	29	16.1	6	6.7	26	14.4	1.7
Westerly.....	6,800	111	16.3	73	21.5	118	17.4	-1.1
WASHINGTON COUNTY.....	22,937	389	16.9	214	18.7	368	16.0	0.9
STATE INSTITUTIONS.....	1,400	.....	.....	.....	.....	105	75.0	.....
WHOLE STATE.....	323,416	7,840	24.2	3,022	18.7	6,594	20.4	3.8

* Estimated.

BIRTHS. *Proportion to Population.*

The varying proportions of births, marriages and deaths, to the population in the different towns, will scarcely fail to be noticed. The proportions of the births are almost as various as the marriages, ranging from 3.8 in every 1,000 of the population, in Jamestown and Little Compton, to 30 in every 1,000, in Lincoln. It will be seen that the larger the population the more uniform, as a rule, will be the proportion to the population.

Of the towns having the largest birth rates are Lincoln, with 30 in every 1,000 of the population, and Cumberland, with 29.6; followed by Newport city and Cranston, in very nearly the same ratio.

Following Jamestown and Little Compton, in the diminutiveness of the birth rates, are Charlestown, with 7.6 in every 1,000 of population; Portsmouth, with 11.5; New Shoreham, with 12.2; and Exeter, with 12.4 in every 1,000.

In 60 per cent. of the towns the birth rate was 20 or more in every 1,000, and in nearly one-fourth of the remaining 40 per cent. the rate was 16 or more in every 1,000.

The proportions of births to population in all the counties entire, and in the cities of Providence, Pawtucket, Newport, Woonsocket, and the whole State, during the last five years, are as follows :

	1888.	1887.	1886.	1885.	1884.	
Bristol County	18.1	19.6	20.9	18.4	22.9	births in every 1,000.
Kent County	24.6	23.0	22.8	20.9	23.3	births in every 1,000.
Newport County	24.4	20.0*	18.9*	18.1*	19.0*	births in every 1,000.
Newport City	28.2	30.9	29.3	27.0	29.2	births in every 1,000.
Providence County	24.9	25.0†	27.2†	22.9†	23.8†	births in every 1,000.
Pawtucket City	25.0	25.0	22.5	23.1	24.3	births in every 1,000.
Providence City	24.4	24.3	24.7	24.8	25.1	births in every 1,000.
Woonsocket	26.8	28.5	27.5			births in every 1,000.
Washington County	16.9	20.4	20.3	18.8	18.5	births in every 1,000.
Whole State	24.2	24.2	24.5	23.1	24.0	births in every 1,000.

PERSONS MARRIED. *Proportion to Population.*

The proportion to the population, of persons married, can be more correctly shown in counties, or in cities and aggregates of towns, rather than in the smaller towns.

The following summary will present the proportions in the manner suggested, for the last four years :

* Newport county towns.

† Providence county towns.

	1888.	1887.	1886.	1885.	
Bristol County.....	12.5	12.8	13.6	12 2	persons married in every 1,000.
Kent County.....	16.7	16.8	16.9	15.5	persons married in every 1,000.
Newport County.....	12.2	11 8	11.6	9.9	persons married in every 1,000.
Newport City.....	11.7	12.0	13.1	15 0	persons married in every 1,000.
Providence County.....	19.8	15.4*	15.9*	15 6*	persons married in every 1,000.
Pawtucket	23.5	24.6	20.0	22.3	persons married in every 1,000.
Providence City.....	21.6	21.0	20.8	18.5	persons married in every 1,000.
Woonsocket.....	17.4	17.2	16.1		persons married in every 1,000.
Washington County.....	18.7	16.6	15.9	15.1	persons married in every 1,000.
Entire State.....	18.7	18.0	17.7	16.3	persons married in every 1,000.

DEATHS. *Proportion to Population.*

The town having the largest death-rate in 1888 was East Greenwich, with 24.6 in every 1,000 of population.

The towns following in the order of the largest death-rate are Cumberland, North Providence and Warren, with the proportions of 24.4, 24.5 and 23.6, respectively, in every 1,000 of population.

The death-rate was smallest in the town of Exeter, with 10.5 in every 1,000; in the towns of Little Compton and Portsmouth with 12.4; and South Kingstown, with 12.8 in every 1,000

Below may be found a summary of the ratios of mortality, in the cities and larger divisions of the State, and the whole State, for 1885, 1886, 1887 and 1888:

	1888.	1887.	1886.	1885.	
Bristol County.....	21 3	18.2	19.2	16.3	in every 1,000 of the population.
Kent County.....	18.4	15.5	17.5	16.4	in every 1,000 of the population.
Towns, Newport County...	18.1	14.6	14.7	16.5	in every 1,000 of the population.
City of Newport.....	15.0	15.3	15.1	13.6	in every 1,000 of the population.
Newport County.....	18.0	15.2	15.0	14.5	in every 1,000 of the population.
Towns, Providence County.	20.0	19.3	18.8	18.1	in every 1,000 of the population.
Pawtucket.....	21.8	22.3	19.0	19 0	in every 1,000 of the population.
City of Providence	21.0	21.6	19.6	18.3	in every 1,000 of the population.
Woonsocket.....	22.1	23.4	19.5		in every 1,000 of the population.
Providence County.....	21.0	21.0	19.2	18.3	in every 1,000 of the population.
Washington County...	16.0	15.5	15.0	14.1	in every 1,000 of the population.
Whole State.....	20.4	19.9	18.8	17.7	in every 1,000 of the population.

The death rate was larger in Bristol county, in 1888, than in the previous year, by more than 3 in every 1,000; was larger in Kent county by nearly 3 in every 1,000; was larger in Newport county by

* County towns.

2.8 per 1,000 of population; was smaller in Newport city, Providence city, Pawtucket and Woonsocket, by proportions not exceeding one per 1,000; was the same rate in Providence county entire, and greater in Washington county and the whole State by about one-half one per 1,000 of population.

A comparative exhibit of the relative proportions of the births, marriages and deaths in the different counties and larger towns, during the last four years, may be found in the following summary:

	Births				Marriages.				Deaths			
	per 1,000				Persons married				per 1,000			
	of population.				per 1,000				per 1,000			
	of population.				of population.				of population.			
	1888.	1887.	1886.	1885.	1888.	1887.	1886.	1885.	1888.	1887.	1886.	1885.
Bristol County.....	18.1	19.6	20.9	18.4	12.5	12.8	13.6	12.2	21.3	18.2	19.2	16.3
Kent County	24.6	23.0	22.8	20.9	16.7	16.8	16.9	15.5	18.4	15.5	17.5	16.4
Newport County	24.4	20.0	18.9	18.1	12.2	11.8	11.6	9.9	18.0	14.6	14.7	16.5
Newport City.....	28.1	30.9	29.3	27.0	11.7	12.0	13.1	15.0	15.0	15.3	15.1	13.6
Providence County*....	25.4	25.0	27.2	22.9	18.0	15.4	15.9	15.6	20.0	19.3	18.8	18.1
City of Pawtucket..	25.4	25.0	22.5	23.1	23.5	24.6	20.0	22.3	21.8	22.3	19.0	19.0
City of Providence....	24.4	24.3	24.7	24.8	21.6	21.0	20.8	18.5	21.0	21.6	19.6	18.3
Washington County....	16.1	20.4	20.3	18.8	18.7	16.6	15.9	15.1	16.0	15.5	15.0	14.1
Entire State..	24.3	24.2	24.5	23.1	18.7	18.0	17.7	16.3	20.4	19.9	18.8	17.7

* Including city of Woonsocket.

TABLE XV.

Showing the Proportions of Births, Marriages and Deaths to the Population, in the Aggregate for the whole State, in each of the last twenty years.

YEARS.	BIRTHS.		MARRIAGES.		DEATHS.		
	Number.	Of population one birth in every	Number.	Of population one person married in every	Number.	Of population one death in every	Deaths in every 1,000 of the population.
1869.....	5,245	41.4	2,289	47.5	3,382	64.2	15.6
1870.....	5,215	41.7	2,362	46.0	3,238	67.1	14.9
1871.....	5,678	38.2	2,336	46.5	3,444	65.0	15.4
1872.....	6,143	35.4	2,537	42.9	4,247	51.2	19.5
1873.....	6,022	36.1	2,630	41.3	4,403	49.4	20.3
1874.....	6,466	39.9	2,541	50.8	4,229	61.1	16.4
1875.....	6,508	39.7	2,485	52.0	4,317	59.8	16.7
1876.....	6,329	40.8	2,253	57.3	4,116	62.7	15.9
1877.....	6,225	41.4	2,282	56.6	4,450	58.0	17.2
1878.....	6,714	38.5	2,324	55.7	4,441	58.1	17.2
1879.....	6,350	43.6	2,396	57.8	4,472	61.9	16.0
1880.....	6,295	43.9	2,769	49.9	4,829	57.3	17.5
1881.....	6,761	40.9	2,750	50.3	5,016	55.1	18.1
1882.....	6,825	40.5	2,634	52.5	5,074	54.5	18.3
1883.....	7,046	39.2	2,611	52.9	5,282	52.4	19.1
1884.....	7,305	41.7	2,558	59.4	5,141	59.2	16.1
1885.....	7,028	43.3	2,488	61.1	5,389	56.4	17.7
1886.....	7,621	40.8	2,750	56.5	5,849	53.2	18.8
1887.....	7,668	41.3	2,839	55.8	6,340	50.0	19.9
1888.....	7,840	41.1	3,022	53.5	6,594	50.0	20.4

BIRTH RATES.

Diagram 1.—Showing the number of births in every 1000 of the population, in each town and each county in the State during the year 1888, computed upon the population as estimated by the town authorities.

For explanation see foot note on next page.



TOWNS AND DIVISIONS
OF THE STATE.

The figures at the top of the perpendicular lines indicate, in whole numbers, the number of births during the year in every 1000 persons. The spaces are fractional parts of an inch. For instance, the heavy horizontal line against Barrington, at the top of this diagram, reaches across about three-tenths of the space between the perpendicular lines in every 1000 of the population, according to estimation. The birth rate of Barrington, in 1888, was about nineteen and three tenths in every 1000 of the population, according to estimation.

BIRTHS, 1888.

The general statistics of births in Rhode Island, during the year 1888, derived from the returns sent to this office, may be found on pages 2 to 6, inclusive, in Tables I, II and III.

The whole number reported is 7,840, as before stated, and is 172 more than the number in 1887.

SEX OF THE CHILDREN BORN.

Of the 7,840 children whose births were reported in 1888, there were 4,023 males and 3,817 females. This gives 105.4 males to each 100 females, or 513.1 males and 486.9 females in each 1,000 children.

The following Table shows the numbers and sex, and the proportions of each sex of the children born in Rhode Island, in each of the last thirty-five years:

TABLE XVI.

Years.	Males.	Females.	Males to each 100 Females.		Per 1,000 Births	
					Males.	Females.
1854.....	1,081.....	1,003.....	107 8,	or.....	518.7	and 481 3
1855.....	1,492.....	1,421.....	105.0,	or.....	512.2	and 487 8
1856.....	1,479.....	1,407.....	105.1,	or.....	512 5	and 487.5
1857.....	2,057.....	1,948.....	105 6,	or.....	513 6	and 486.4
1858.....	2 200.....	2,053.....	107 2,	or.....	517.3	and 482.7
1859.....	2,209.....	2,097.....	105 3,	or.....	513.6	and 487 0
1860.....	2,263.....	2,212.....	102 3,	or.....	505.7	and 494.3
1861.....	2,531.....	2,291.....	110 5,	or.....	524.9	and 475.1
1862.....	2,152.....	1,967.....	109.4,	or.....	522 5	and 477.5
1863.....	1,892.....	1,288.....	105.8,	or.....	514.1	and 485.9
1864.....	1,949.....	1,942.....	100.3,	or.....	500.9	and 499.1
1865.....	2,096.....	1,857.....	112 9,	or.....	530.2	and 469.8
1866.....	2,546.....	2,356.....	108 0,	or.....	519.4	and 480 6
1867.....	2,665.....	2,164.....	107.0,	or.....	518.7	and 481.3
1868.....	2,745.....	2,627.....	104 5,	or.....	511.0	and 489.0
1869.....	2,685.....	2,560.....	104 9,	or.....	511.9	and 488.1
1870.....	2,679.....	2,536.....	105.6,	or.....	513.7	and 486.3
1871.....	2,878.....	2,800.....	102 8,	or.....	506.9	and 493.1
1872.....	3,085.....	3,058.....	100.9,	or.....	502 2	and 497 8
1873.....	3,135.....	2,887.....	108 6,	or.....	520 6	and 479.4
1874.....	3,311.....	3,155.....	104.9,	or.....	512.1	and 487.9
1875.....	3,362.....	3,146.....	106.9,	or.....	516 6	and 483.4
1876.....	3,291.....	3,038.....	108.3,	or.....	520.0	and 480.0
1877.....	3,163.....	3,072.....	103.0,	or.....	507.3	and 492.7
1878.....	3,402.....	3,312.....	102.7,	or.....	506.7	and 493.3
1879.....	3,259.....	3,091.....	105.4,	or.....	513.2	and 486.8
1880.....	3,241.....	3,051.....	106.8,	or.....	514.8	and 485.2
1881.....	3,498.....	3,263.....	107.2,	or.....	517.3	and 482.7
1882.....	3,509.....	3,316.....	105 8,	or.....	514 1	and 485.9
1883.....	3,548.....	3,498.....	101.4,	or.....	503 5	and 496 5
1884.....	3,713.....	3,592.....	103.4,	or.....	508.3	and 491.7
1885.....	3,591.....	3,437.....	104.4,	or.....	510.3	and 489.7
1886.....	3,897.....	3,724.....	104.6,	or.....	511.3	and 488.7
1887.....	3,968.....	3,700.....	107 2,	or.....	517.5	and 482.5
1888.....	4,023.....	3,817.....	105.4,	or.....	513.1	and 486.9

An examination of Table XVI will show the continued usual preponderance in the births of males. This disproportion, however, lessens as the two sexes approach adult life, where they are about equal in number. More male children die under five years of age than female. This peculiar susceptibility of male children to mortality from infantile diseases is too well known to need further illustration.

PROPORTION OF THE SEXES. ●

In Table II, on pages 4 and 5, will be found the number of children born in the different divisions of the State during the year 1888, together with the number of each sex.

The following Table will give more concisely the whole number of children born, arranged according to sex and locality, and the proportion of male children to every 100 female children :

TABLE XVII.

BIRTHS, 1888.	Bristol County.	Kent County.	Newport County.	Providence County.	Washington County.	Newport City.	Pawtucket.	Providence City.	Woonsocket.	Whole State.
Males.....	106	286	377	3,050	204	301	340	1,581	281	4,023
Females.....	108	272	359	2,893	185	298	308	1,472	254	3,817
Total.....	214	558	736	5,943	389	599	648	3,053	535	7,840
Males to each 100 females.....	98.1	105.1	105.0	105.4	110.0	101.0	110.5	107.4	110.6	105.4

There was a very slight excess of female births in Bristol county, in 1888, a proportion of about two per cent. In a series of twenty-six years Bristol county has, in the aggregate, had a larger proportion of male births than any other division of the State.

In Kent county the proportion of male births was much smaller than in the preceding year, but varying only slightly from the average of twenty-five years.

In Newport county there was a falling off in the preponderance of the male births, of about one per cent.

The proportions of the sexes of the children born in Providence county outside of Providence city, and in Providence city, varied but little in 1888 from those of the last previous year.

In Washington county there was an increase of male births over the preceding year of about four per cent., and in the whole State a decrease of about two per cent. in the proportion of male in excess of female births.

The following Table exhibits the proportions, with births of both sexes, for the past twenty-six years, in the larger divisions of the State and in the whole State :

TABLE XVIII.

NUMBER OF MALES TO EACH 100 FEMALES.							
BIRTHS.	Bristol County.	Kent County.	Newport County.	Providence County Towns.*	Providence City.	Washington County.	Whole State.
1863.....	120.0	98.4	97.0	101.8	111.4	108.7	105.8
1864.....	106.8	87.3	90.6	107.4	97.3	103.4	100.3
1865.....	119.3	118.2	108.8	118.8	113.8	88.1	112.9
1866.....	109.4	113.1	103.4	104.9	108.4	124.0	105.0
1867.....	115.5	98.3	117.8	106.3	104.5	120.4	107.7
1868.....	117.4	68.7	100.2	101.6	102.4	136.5	104.5
1869.....	115.7	116.7	102.7	98.0	107.5	120.6	104.9
1870.....	126.4	111.6	100.0	105.1	104.9	99.5	105.6
1871.....	131.8	97.9	132.5	100.8	95.2	113.3	102.8
1872.....	109.2	92.8	109.1	103.5	95.7	110.6	100.9
1873.....	129.2	113.0	117.9	104.5	100.0	104.7	108.6
1874.....	98.7	111.9	101.3	110.4	102.9	94.0	104.9
1875.....	95.2	103.1	97.7	104.3	109.1	134.3	105.9
1876.....	142.1	104.4	108.5	108.0	106.8	103.7	108.3
1877.....	138.7	102.4	98.5	100.3	104.9	95.3	103.0
1878.....	120.5	120.6	94.8	101.5	106.8	78.8	102.7
1879.....	124.3	95.5	108.6	105.4	105.7	106.3	105.4
1880.....	117.2	110.5	113.0	102.4	107.6	95.4	106.1
1881.....	91.2	111.3	102.0	105.9	109.0	115.7	107.2
1882.....	94.7	110.2	112.5	103.1	106.5	105.7	105.8
1883.....	94.0	97.6	97.0	103.5	102.2	102.2	101.4
1884.....	105.0	111.7	92.9	102.5	105.8	99.0	103.4
1885.....	132.2	107.3	98.0	104.8	103.6	104.3	104.4
1886.....	120.0	81.7	102.6	106.7	105.0	121.7	104.6
1887.....	115.1	121.7	106.6	103.9	107.9	106.7	107.2
1888.....	98.1	105.1	105.0	103.4	107.4	110.2	105.4

The following summary will show the average number of males to each 100 females, born during the twenty-six years from 1863 to 1888, in the different divisions of the State :

* Including cities of Pawtucket and Woonsocket.

Bristol County.....	114.5 males to each 100 females.
Kent County.....	105.4 males to each 100 females.
Newport County.....	105.1 males to each 100 females.
Providence County Towns.....	104.8 males to each 100 females.
Providence City.....	105.4 males to each 100 females.
Washington County.....	106.7 males to each 100 females.
Whole State.....	104.8 males to each 100 females.

BIRTHS AND SEASON.

Table II, on pages 4 and 5 of this report, gives the number of births occurring in the different months of the year, in the several divisions of the State.

According to this Table, the greatest number of births in any one month in 1888 occurred in October, and the largest in any quarter in the third; a fact not invariably observed in this part of the year.

The following Table shows the total number of children born in the State of Rhode Island, according to the returns, in each quarter of each of the last six years; and also the aggregate number and the percentage of the aggregate of each quarter in thirty-five years, from 1854 to 1888, inclusive:

TABLE XIX.

QUARTERS.	1888.	1887.	1886.	1885.	1884.	1883.	1854 to 1887, inclusive.	
							Number.	Per cent.
January—March.....	1,862	1,828	1,763	1,669	1,734	1,641	45,560	23.66
April—June.....	1,833	1,859	1,749	1,736	1,755	1,668	45,491	23.62
July—September.....	2,084	1,956	2,041	1,768	1,868	1,893	50,306	26.12
October—December.....	2,061	2,025	2,068	1,855	1,948	1,844	51,227	26.60
Whole Year.....	7,840	7,668	7,621	7,028	7,305	7,046	192,584	100.00

By the above Table it will be seen that, according to the registration of thirty-five years, the average proportions of births to the whole number of births, in the different quarters of the year, were as follows:

January—March.....	236.6 in every 1,000 births.
April—June.....	236.2 in every 1,000 births.
July—September.....	261.2 in every 1,000 births.
October—December.....	266.0 in every 1,000 births.

The proportions of births in Rhode Island, in the different quarters of the year, to the whole number of births in 1888, were as follows:

1. January—March	23.7 per cent., or.....	237 in every 1,000
2. April—June.....	23.4 per cent., or.....	234 in every 1,000
3. July—September.....	26.6 per cent., or.....	266 in every 1,000
4. October—December.....	26.3 per cent., or.....	263 in every 1,000
	<hr/> 100.0	<hr/> 1,000

First six months.....471 births in every one thousand.

Second six months.....529 births in every one thousand.

BIRTHS; SEX AND SEASON.

In Table II, on pages 4 and 5, will also be found the number of births of *each sex* by months, as they occurred in the different divisions of the State, during the year 1888. From it we ascertain the number of *each of the sexes* born during each quarter of the year, with their relative proportions, and also the aggregates and proportions of the same for the whole State.

The following Table will present a summary of the quarterly periods, number of births and proportions of the sexes, for the same year :

	Males.	Females.	Males to each 100 Females.	Per 1,000, each quarter.	
				Males.	Females.
1. January—March.....	946.....	916	103.3, or.....	508.....	492
2. April—June.....	956.....	877	109.0, or.....	522.....	478
3. July—September.....	1,075.....	1,009.....	106.5, or.....	516.....	484
4. October—December	1,046.....	1,015.....	103.1, or.....	508.....	492
Whole year, 1888.....	<hr/> 4,023.....	<hr/> 3,817.....	<hr/> 105.4, or.....	<hr/> 513.....	<hr/> 487

The following Table shows the number of male children born to every 100 female children, in each quarter of the last four years; and also the proportion of births of male children to each 100 female children born, during four periods of five years each, from 1866 to 1885, inclusive :

TABLE XX.

YEARS.	1888.	1887.	1886.	1885.	5 years,	5 years,	5 years.	5 years.
					1881-1885.	1876-1880.	1871-1875.	1866-1870.
First Quarter.....	103.3	100.2	103.8	113.2	105.8	106.0	101.5	106.7
Second Quarter	109.0	110.3	103.8	107.1	104.8	102.7	104.7	107.3
Third Quarter.....	106.5	108.8	103.5	98.4	105.1	107.1	104.8	106.0
Fourth Quarter.....	103.1	109.6	107.2	100.1	102.5	108.2	106.5	104.8
Total average.....	<hr/> 105.4	<hr/> 107.2	<hr/> 104.6	<hr/> 104.4	<hr/> 101.5	<hr/> 106.2	<hr/> 104.2	<hr/> 106.2

For the purpose of further comparison, the following summary will show the proportions of the sexes born in the State in each quarter of the year, in the aggregate of a period of twenty years:

	Males to each	
	100 Females.	Males. Females.
1. January—March.....	105.0, or.....	512.2 and 487.8 in every 1,000 births.
2. April—June.....	104.9, or.....	511.9 and 488.1 in every 1,000 births.
3. July—September.....	105.7, or.....	513.9 and 486.1 in every 1,000 births.
4. October—December.....	105.5, or.....	513.4 and 486.6 in every 1,000 births.
Whole number, 20 years.....	105.3, or.....	513.0 and 487.0 in every 1,000 births.

That the season of the year has any considerable influence in the causation of sex, seems to be negatived by the statistics presented above.

PARENTAGE.

By reference to Table 1, page 2, in the division of births there will be found the parentage of the children born in Rhode Island, during the year 1888. It will be seen that of the whole number—7,840—there were 3,028 of American parentage, 3,348 foreign, and 1,464 of mixed parentage.

By mixed parentage is meant the children born of American fathers and foreign mothers, and of foreign fathers and American mothers. Of American fathers there were 721, and of foreign fathers 743.

The following Table will show the number and parentage of the children born in the State, and the variations of the same from year to year, in each of the last three years; and also the number and variations occurring in six periods of five years each, from 1858 to 1887, inclusive:

TABLE XXI.

PARENTAGE.	1888.	1887.	1886.	5 years, 1883 to 1887.	5 years, 1878 to 1882.	5 years, 1873 to 1877.	5 years, 1868 to 1872.	5 years, 1863 to 1867.	5 years, 1858 to 1862.
American fath. and mo...	3,028	2,935	3,139	15,001	14,169	13,431	12,214	9,712	10,609
Foreign fath. and mo.....	3,348	3,315	3,155	15,245	13,562	13,990	12,366	9,968	9,697
American fath., for. mo...	721	672	652	3,044	2,327	1,782	1,353	876	814
Foreign fath., Amer. mo..	743	746	675	3,378	2,887	2,357	1,720	941	755
Parentage not stated.....	..	..	..	..	..	..	..	70	223
Total.....	7,840	7,668	7,621	36,668	34,945	31,560	27,653	21,567	22,098

The following Table of *percentages* will show, in a different and perhaps clearer way, the same changes that have occurred in the proportions of the births in the different classes of parentage during the last three years; and during thirty years, from 1858 to 1887, inclusive, in six equal periods:

TABLE XXII.

PARENTAGE.	1888.	1887.	1886.	5 years, 1883 to 1887.	5 years, 1878 to 1882.	5 years, 1873 to 1877.	5 years, 1868 to 1872.	5 years, 1863 to 1867.	5 years, 1858 to 1862.
American fath. and mo...	38.62	38.28	41.19	40.91	43.03	42.55	44.17	45.18	48.50
Foreign fath. and mo....	42.70	43.23	41.40	41.58	41.23	44.35	41.72	46.37	44.33
American fath., for. mo...	9.20	8.76	8.55	8.30	6.95	5.84	4.89	4.07	3.72
Foreign fath., Amer. mo..	9.48	9.73	8.86	9.21	8.79	7.26	6.22	4.38	3.45
Total.....	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

An examination of Table XXI will show that there has been a constant increase in the number of children of foreign parentage. The same may be said relative to the offspring of mixed marriages. More than 60 per cent. of the children born in this State during 1888 were of foreign and mixed parentage.

The following Table will present the percentages of children of American and of foreign-born fathers, and of American and foreign-born mothers, respectively, in each of the last three years, and in each of six periods of five years each, from 1858 to 1887, inclusive:

TABLE XXIII.

CHILDREN WITH	1888.	1887.	1886.	5 years, 1883 to 1887.	5 years, 1878 to 1882.	5 years, 1873 to 1877.	5 years, 1868 to 1872.	5 years, 1863 to 1867.	5 years, 1858 to 1862.
American fathers.....	47.82	47.04	49.74	49.21	50.08	48.10	49.06	49.25	52.22
Foreign fathers.....	52.18	52.96	50.26	51.79	49.92	51.60	50.94	50.75	47.78
American mothers	48.10	48.01	50.05	49.91	51.79	49.80	50.39	49.56	51.95
Foreign mothers.....	51.90	51.99	49.95	50.09	48.21	50.20	49.61	50.44	48.05

The above Table gives the percentages of increase in the number of births of both foreign and mixed parentage. The same story is told here as in Tables XXI and XXII, a gradual falling off in the

birth of children of purely American parentage. There are more foreign mothers married to American fathers than American born mothers intermarrying with fathers of foreign parentage. For a fuller discussion of this subject, see the Reports upon the Registration of births, marriages and deaths in Rhode Island, for 1885-6. It may be added, however, that the following are some of the results arrived at:

For every 1,000 married women of all nativities there were 13.2 births; for every 1,000 in the class of American birth (whether of foreign parentage or not) there were in that class 15.1 births; and for every 1,000 in the class of foreign born there were 23.3 births.

Of the American married females, 998 were colored.

BIRTHS OF COLORED CHILDREN.

The number of births of children of colored parentage reported for the year 1888 is 202. The number is 9 less than that of 1887.

In regard to sex, the numbers and proportions were as follows, viz.: Males 109, females 93; or 53.5 males and 46.5 females in every 100 births; or 117.2 males to each 100 females.

The following summary will show the changes that have occurred from year to year, in the proportions of the sexes of colored children born in Rhode Island, during the last thirteen years:

Years.	Whole Number.	Males.	Females.	Males to each 100 females.
1876.....	111.....	64.....	107.....	59.8
1877.....	168.....	86.....	82.....	104.8
1878.....	172.....	79.....	93.....	85.0
1879.....	159.....	84.....	75.....	113.5
1880.....	140.....	75.....	65.....	115.4
1881.....	192.....	101.....	91.....	111.0
1882.....	179.....	76.....	103.....	73.7
1883.....	197.....	100.....	97.....	103.1
1884.....	185.....	91.....	94.....	96.8
1885.....	199.....	93.....	106.....	87.7
1886.....	212.....	117.....	95.....	123.0
1887.....	211.....	111.....	100.....	111.0
1888.....	202.....	109.....	93.....	117.2

The following Table will show the location, number, sex, etc., of colored births during 1888:

TABLE XXIV.

Showing Number, Sex, etc., of Colored Births, 1888.

TOWNS AND CITIES.	Whole Number.	Males.	Females.	COUNTIES.
Bristol.....	8	2	1	Bristol County..... 3
East Greenwich.....	4	2	2	
Warwick.....	6	3	3	Kent County..... 10
Middletown.....	2	2		
Newport City.....	41	18	23	Newport County..... 43
Cranston.....	3	3		
East Providence.....	1	1		
Johnston.....	1	1		
Lincoln.....	2	1	1	
North Providence.....	1	1		
Pawtucket.....	2	1	1	
Scituate.....	1	1		
Providence City.....	122	64	58	Providence County. 133
Charlestown.....	2	1	1	
Exeter.....	1	1		
Hopkinton.....	2		2	
North Kingstown.....	1	1		
South Kingstown.....	5	4	1	
Richmond.....	2	2		Washington County. 13
Total.....	202	109	93	..... 262

NUMBER OF CHILD OF THE MOTHER.

The following Table shows the number of the child of the mother; that is, how many of the children born were reported as the first, second or third child, etc., of their respective mothers. The statistics on this subject begin with the year 1857, and the following Table includes the children reported during the last six years, and also the total for thirty years, 1857 to 1886, inclusive:

TABLE XXV.

NUMBER OF THE CHILD OF THE MOTHER.	1883.	1884.	1885.	1886.	1887.	1888.	30 years, 1857-1886.
First.....	1,764	1,847	1,663	1,783	1,853	1,998	40,496
Second.....	1,365	1,356	1,362	1,559	1,483	1,545	32,941
Third.....	1,026	1,087	1,033	1,144	1,146	1,182	25,747
Fourth.....	822	777	767	795	918	884	19,389
Fifth.....	614	643	597	660	585	609	14,633
Sixth.....	443	472	498	481	475	475	10,704
Seventh.....	343	374	345	359	375	329	7,623
Eighth.....	245	269	282	287	289	281	5,324
Ninth.....	169	187	168	202	198	185	3,521
Tenth.....	106	103	134	131	143	141	2,278
Eleventh.....	64	81	73	87	78	83	1,345
Twelfth.....	37	49	57	55	65	50	850
Thirteenth.....	23	32	27	39	32	38	459
Fourteenth.....	9	16	11	19	15	21	218
Fifteenth.....	7	5	7	10	6	9	122
Sixteenth.....	2	0	1	7	3	4	63
Seventeenth.....	6	4	1	2	3	2	42
Eighteenth.....	1	2	1	1	0	3	14
Nineteenth.....	0	0	1	0	0	1	6
Twentieth.....	0	1	0	0	1	0	4
Twenty-first.....	0	0	0	0	0	0	3
Twenty-second.....	0	0	0	0	0	0	2
Total.....	7,046	7,305	7,028	7,621	7,668	7,840	165,784

The increase in the whole number of births in 1888, over the previous year, was 172, or two and two-tenths per cent. The increase of population was probably not quite as much.

The increase in number in the class of first child of the mother was nearly nine per cent., while there was a slight increase in the class of second, third and fifth child of the mother.

It is not unusual to find varying proportions from year to year, but there seems to be an increased proportional number of mothers who have ten or more children.

The proportion of each class to the whole number will be shown by the following Table, which gives the percentage of the children born

in each of the last five years, who were respectively the first, second, third, etc., children of the mothers, and which will also give the average percentage of each class of births, during a period of ten years, from 1868 to 1877, inclusive, and of five years, 1878 to 1882, and from 1883 to 1887, inclusive:

TABLE XXVI.

NUMBER OF THE CHILD.	1888.	1887.	1886.	1885.	1884.	5 years. 1883 to 1887.	5 years, 1878 to 1882.	10 years, 1868 to 1877.
First	25.49	24.16	23.40	23.66	25.28	24.30	23.1	25.2
Second	19.71	19.34	20.45	19.38	18.56	19.22	18.7	20.7
Third	15.08	14.94	15.01	14.70	14.88	14.82	16.9	15.5
Fourth	11.28	11.84	10.43	10.91	10.64	11.05	12.2	11.4
Fifth	7.77	7.63	8.66	8.49	8.80	8.56	9.1	8.4
First to Fifth	79.33	77.91	77.95	77.14	78.16	77.80	80.0	81.1
Sixth and over	20.67	22.09	22.05	22.83	21.84	22.20	20.0	18.9
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.0	100.0

PLURALITY BIRTHS.

The general statistics in relation to plural births, in Rhode Island, may be found on page 6, in Table III.

There were sixty-six cases during the year, all of which were twins, thus making the number of one hundred and thirty-two children.

Of the 132 children of plural birth, 66 were males, and 66 were females.

The cases occurred in the different divisions of the State as follows: Bristol county, 3; Kent county, 2; Newport county towns, 3; Newport city, 8; Providence county towns, 24*; Providence city, 24; Washington county, 2.

The following exhibit will show the parentage of children of plurality birth in Rhode Island, in 1888, and number of each:

* Including Pawtucket and Woonsocket.

Parents, both native Americans, or born in the United States.....	50
“ “ born in Ireland.....	12
“ “ “ France, or French Canadians.....	12
“ “ “ England.....	12
“ “ “ Switzerland.....	2
“ “ “ Italy.....	6
“ “ “ Western Islands.....	2
American father and Irish mother.....	10
American father and English mother.....	4
American father and French mother.....	2
French father and American mother.....	2
Irish father and American mother.....	6
Irish father and English mother.....	2
English father and Irish mother.....	4
English father and American mother.....	4
Scotch father and Irish mother.....	2
Total.....	132

The months in which the plurality births occurred were as follows:

January..... 8	April.....14	July.....10	October..... 6
February.... 8	May.....18	August..... 8	November....12
March..... 4	June.....16	September....18	December....10
—	—	—	—
First Quarter... 20	Second Quarter... 48	Third Quarter.... 36	Fourth Quarter...28
First half of year..... 68	Second half of year..... 64		
Total.....	132		

The general statistics of births, and number of cases reported in Rhode Island during a period of thirty-five years, that is, from 1854 to 1888, inclusive, are as follows:

188,493 cases of single births.....	giving 188,493 children.
2,012 cases of twin births.....	giving 4,024 children.
21 cases of triple births.....	giving 63 children.
1 case of quadruple births.....	giving 4 children.
190,527 cases of child birth.....	giving 192,584 children.

Of the whole number of cases of child-birth (190,527) during the thirty-five years, one in 96 produced twins, one in 9,358 produced triplets, and one in 190,527 produced quadruplets.

Of the whole number of children born during the same period, (192,584), ascertained from the reports, one in every 47.8 was a twin, and one in every 3,058 was a triplet.

Of the 2,034 cases of plurality birth which have occurred in the State during the last thirty-five years, there were 845 cases in which both parents were Americans; 951 cases in which both parents were foreign; 230 cases in which the parentage was mixed, that is, one American and one foreign parent; and 8 in which the parentage was not stated.

The whole number of children born in plurality cases, during the thirty-five years, was 4,091, of whom 2,053 were males, and 2,034 were females; the sex of the remaining four was not given.

STILL-BORN.

The whole number of still-born children reported in Rhode Island, for the year 1888, was 295; this number is 19 more than that for the year 1887.

The following are the numbers reported from the different divisions of the State :

Bristol County.....	11
Kent County.....	15
Newport County Towns.....	4
Newport City.....	24
Providence County Towns	48
Pawtucket.....	24
Woonsocket.....	23
Providence City... ..	142
Washington County.....	4
<hr/>	
Whole State.....	295

The following Table will give the number in each town from which still-births were reported :

TABLE XXVII.

Still-Born, 1888, Locality, Number, Sex, Parentage and Color.

TOWNS AND DIVISIONS OF THE STATE.	Whole Number.	SEX.		PARENTAGE.		COLOR.	
		Males.	Females.	American.	Foreign.	White.	Colored.
Barrington.....	1	.....	1	1	.....	1	.....
Bristol.....	8	5	3	7	1	8	.....
Warren.....	2	1	1	2	.....	2	.....
BRISTOL COUNTY.....	11	6	5	10	1	11	.....
Coventry.....	5	1	4	5	.....	5	.....
East Greenwich.....	5	3	2	2	3	5	.....
West Greenwich.....	2	1	1	2	.....	2	.....
Warwick.....	3	2	1	3	.....	3	.....
KENT COUNTY.....	15	7	8	12	3	15	.....
Newport City.....	24	12	12	8	16	22	2
New Shoreham.....	2	2	.....	2	.....	2	.....
Portsmouth.....	1	1	.....	1	.....	1	.....
Tiverton.....	1	.....	1	1	.....	1	.....
NEWPORT COUNTY.....	28	15	13	12	16	26	2
Burrillville.....	2	2	.....	2	.....	2	.....
Cumberland.....	5	3	2	1	4	5	.....
East Providence.....	8	3	5	7	1	8	.....
Johnston.....	6	2	4	.....	6	6	.....
Lincoln.....	26	11	15	3	23	26	.....
North Providence.....	1	1	.....	.....	1	1	.....
Pawtucket.....	24	15	9	8	16	24	.....
Providence City.....	142	82	60	58	84	123	19
Woonsocket.....	23	14	9	5	18	23	.....
PROVIDENCE COUNTY.....	237	133	104	84	153	218	19
Charlestown.....	2	2	.....	2	.....	2	.....
Narragansett District.....	1	.....	1	.....	1	1	.....
Westerly.....	1	1	.....	.....	1	1	.....
WASHINGTON COUNTY.....	4	3	1	2	2	4	.....
WHOLE STATE.....	295	164	131	120	175	274	21

SUMMARY OF SEX OF STILL-BORN.

The following Table shows the number and sex of the still-born children whose births were reported in Rhode Island, during each of the last five years, and also of a period of thirty-two years, extending from January 1, 1854, to December 31, 1885 :

TABLE XXVIII.

SEX.	1888.	1887.	1886.	1885.	1884.	January 1, 1854, to Dec. 31, 1885.
Males	164	169	157	149	178	3,824
Females	131	107	136	122	94	2,674
Total.....	295	276	293	271	272	6,498

The average proportions of the sexes of the still-born, for the period of thirty-two years, were as follows: In every 100 still-births there were about 59 males and 41 females.

Season of Still-Births.—During the thirty-two years included in Table XXVIII, the proportions in relation to season were as follows :

First Quarter.....	1,613	Third Quarter.....	1,743
Second Quarter.....	1,505	Fourth Quarter.....	1,637
<hr/>			
First half of the year.	3,118	Last half of the year.	3,380
Total.....	6,498		

The births of the still-born in 1888 occurred in the different months of the year as follows :

January.....28	April.....18	July.....29	October.....19
February.....23	May.....26	August.....29	November.....19
March.....34	June.....20	September.....19	December.....22
—	—	—	—
85	73	77	60
First 6 months.....	158	Second 6 months..	137
Whole number.....			
295			

PARENTAGE OF THE STILL-BORN.

Of the 295 still-born children reported in 1888, there were 120 of American, and 175 of foreign parentage, reckoned by the nativity of the fathers, that is, the father's name given; and 143 of American and 152 of foreign, reckoned by the nativity of the mothers.

To show the changes that have occurred, from year to year, in the percentages of parentage of *the still-born*, reckoning by the parentage of the mothers, in contrast with the percentages of the same nativities to the *whole number of births*, reckoned by the parentage of the father, the following resumé, for various years and periods of years, is presented :

Years.	Of Whole Number Births.		Of Whole Number Still-Born.	
	American.	Foreign.	American.	Foreign.
14 years,				
1859-1872.....	50.54 and	49.46 in each 100.....	51.84 and	48.16 in each 100.
10 years,				
1873-1882.....	49.10 and	50.90 in each 100.....	51.84 and	48.16 in each 100.
1883.....	49.94 and	50.06 in each 100.....	50.98 and	49.02 in each 100.
1884.....	49.91 and	50.09 in each 100.....	49.63 and	50.37 in each 100.
1885.....	49.76 and	50.24 in each 100.....	48.00 and	52.00 in each 100.
1886.....	49.74 and	50.26 in each 100.....	47.44 and	52.56 in each 100.
1887.....	47.04 and	52.96 in each 100.....	49.63 and	50.37 in each 100.
1888.....	47.82 and	52.18 in each 100.....	48.47 and	51.53 in each 100.

ILLEGITIMATES.

The following Table will exhibit the number, sex, color, parentage and locality of birth of illegitimates in Rhode Island, in 1888 :

TABLE XXIX.

TOWNS.	Whole Number.	SEX.		COLOR.		PARENTAGE.		Alms-houses and Penal Institutions.
		Males.	Females.	Colored.	White.	American.	Foreign.	
Barrington.....	1	1	.....	.....	1	1	.....	.....
West Greenwich.....	1	1	.....	.....	1	1	.....	.....
Tiverton.....	1	.....	1	.....	1	1	.....	.....
Newport City.....	10	4	6	5	5	8	2	2
Cranston.....	2	2	.....	1	1	2	.....	2
Johnston.....	1	1	.....	.....	1	1	.....	.....
North Providence.....	2	.....	2	.....	2	2	.....	.....
Pawtucket.....	2	2	.....	.....	2	1	1	.....
Scituate.....	1	.....	1	.....	1	1	.....	.....
Woonsocket.....	1	.....	1	.....	1	.....	1	.....
Providence City.....	40	24	16	15	25	31	9	15
Exeter.....	1	1	.....	.....	1	1	.....	.....
Richmond.....	1	.....	1	.....	1	1	.....	.....
Whole State.....	64	36	28	21	43	51	13	19

There were returns, during 1888, of 64 children of illegitimate parentage. The number is 16 more than that of 1887.

Sex.—Of the 64 there were 36 males and 28 females.

The proportions of the sexes were at the rate of about 57 males and 43 females in each 100 births, or 129 males to every 100 females.

Color.—Of the 64 illegitimates born during 1888, 43 were white, and 21 colored.

Parentage.—Of the 64, 51 were born of American mothers and 13 of foreign born mothers. The colored illegitimates were of American parentage. There were, of the 43 white illegitimates, 30 born of American mothers, and 13 of foreign born mothers.

The parentage given is of native born and foreign born, that is, mothers born in the United States of foreign born parents are reckoned as of American parentage.

Nineteen, or nearly one-third of the illegitimates, were born of pauper or criminal mothers, in public, charitable or penal institutions.

MARRIAGES, 1888.

The number of marriages registered in Rhode Island, during the year 1888, was 3,022. This number is 272 more than in 1886, and 183 more than in 1887.

The general statistics of marriage in 1888, in relation to season and number in the different divisions of the State, may be found in Table IV, on the seventh page.

The statistics in relation to the proportion to population of persons married in 1888, in each of the towns and general divisions of the State, may be found in Tables XIV and XV, on pages 74 and 78.

The following Table will present the number of marriages, and the ratio of marriage to population, in each year for a period of twenty-nine years, 1860 to 1888, inclusive :

TABLE XXX.

YEARS.	Number Marriages.	Of population, one person married in every	Persons married pr 1,000 of population.	YEARS.	Number Marriages.	Of population, one person married in every	Persons married pr 1,000 of population.
1860.....	1,748	50.0	20.0	1876.....	2,253	57.3	17.5
1861.....	1,533	56.8	17.6	1877.....	2,282	56.6	17.7
1862.....	1,450	61.1	15.1	1878.....	2,324	55.7	17.9
1863.....	1,618	54.7	18.3	1879.....	2,396	57.8	17.5
1864.....	1,844	50.1	19.9	1880.....	2,769	49.9	20.0
1865.....	1,896	48.7	20.5	1881.....	2,750	50.3	19.9
1866.....	2,318	39.9	25.1	1882.....	2,634	52.5	19.0
1867.....	2,344	39.8	25.1	1883.....	2,611	54.4	18.3
1868.....	2,285	40.5	24.8	1884.....	2,558	58.1	17.2
1869.....	2,289	47.5	21.1	1885.....	2,488	61.3	16.3
1870.....	2,362	46.0	21.7	1886.....	2,750	56.5	17.7
1871.....	2,336	46.5	21.5	1887.....	2,839	55.8	18.0
1872.....	2,537	42.9	23.2	1888.....	3,022	53.5	18.7
1873.....	2,630	41.3	24.2	Annual Average...		50.6	19.8
1874.....	2,541	50.8	19.6				
1875.....	2,485	52.0	19.2				

SEASON.

The following Table will show the number and percentage of marriages in Rhode Island, in each quarter of the year 1888, together with the aggregate number and percentage in each quarter for thirty-five years, viz., from 1854 to 1888, inclusive :

TABLE XXXI.

MONTHS.	Number of Marriages each month.	Number of Marriages each Quarter, 1888.	Percentage of each Quar. to total Marriages, 1888.	Number of Marriages per Quarter, 35 yrs., 1854-1888.	Percentage each Quarter, 35 years.
January.....	270}	1st Quarter... 615	20.35	1st Quarter... 16,852	22.03
February.....	245}				
March.....	100}				
April.....	302}	2d Quarter... 818	27.06	2d Quarter... 19,025	24.88
May.....	222}				
June.....	294}				
July.....	224}	3d Quarter... 741	24.52	3d Quarter... 17,897	23.39
August.....	244}				
September.....	273}				
October.....	305}	4th Quarter... 848	28.07	4th Quarter... 22,691	29.70
November.....	357}				
December.....	186}				
Total.....		3,022	100.00	*76,485	100.00

The largest number of marriages, in any one month during 1888, occurred in the month of November. This is in accordance with the rule for thirty-five years.

There was an agreement with the rule, also, in the proportions of the number of marriages, in the different quarters of the year, to the whole number during the year. The rule has been as follows: The largest proportion in the last quarter; the next largest in the second quarter; followed by the third quarter; and, finally, the first quarter having the smallest proportion.

During 1888 the proportions in the different quarters, from the largest to the smallest, were as follows: Last quarter, 28.07 per cent.; second quarter, 27.06 per cent.; third quarter, 24.52 per cent.; first quarter, 20.35 per cent.

NATIVITY OF PERSONS MARRIED.

The following Table shows the *number* of marriages, according to the nativities of the parties, for each of the last five years, and also

* Including 20, date not given, recorded previous to 1860.

for the aggregate of five years, from 1878 to 1882, inclusive, and of twenty years, from 1858 to 1877, inclusive :

TABLE XXXII.

BIRTH-PLACE.	1888.	1887.	1886.	1885.	1884.	5 years, 1883-1887. Total.	25 years, 1858-1882. Total.
United States.....	1,496	1,465	1,480	1,374	1,410	7,157	33,553
Foreign countries.....	935	808	739	677	668	3,601	13,753
American groom, foreign bride.....	329	303	290	236	257	1,323	3,488
Foreign groom, American bride.....	262	263	241	201	223	1,165	3,876
Not stated.....							64
Total.....	3,022	2,839	2,750	2,488	2,558	13,246	51,734

There was an increase in the *whole number* of marriages of all classes of nativity, in 1888, over any year since 1882, and over any previous year in all classes except that of which both were natives of the United States.

It will be understood that in the above enumeration the parentage of the persons married is not considered, but the country where born, and not whether the parents were native or foreign born.

In the following Table are given the *percentages* of American, foreign and mixed marriages, in each of the last five years, and in the aggregate of five years, 1883 to 1887, inclusive, and of twenty-five years, 1858 to 1882, inclusive :

TABLE XXXIII.

BIRTH-PLACE.	1888.	1887.	1886.	1885.	1884.	5 years, 1883-1887.	25 years, 1858-1882.
United States.....	49.50	51.60	53.81	55.22	55.12	51.02	61.30
Foreign countries.....	30.91	28.46	26.87	27.21	26.12	27.19	25.13
Mixed.....	19.56	19.94	19.32	17.57	18.76	18.79	13.57
Total.....	100.00	100.00	100.00	100.00	100.00	100.00	100.00

It will be seen, in Table XXXIII, that the *proportions* of the different classes of persons married, to the whole number of marriages,

follows closely the absolute numbers given in Table XXXII. It will also be noticed that the proportion of those born in the United States (although largely of foreign born parents) is smaller than in any other year since 1857, and unquestionably smaller than in any year since the commencement of registration.

AGES OF PERSONS MARRIED.

The following Table will show the number of grooms who were married, in 1888, to brides in the same age period of life, or in age periods earlier or more advanced :

TABLE XXXIV.

AGES OF GROOMS.	AGES OF BRIDES.													Number of Grooms.
	Under 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 65.	65 to 70.	70 to 75.	75 to 80.	
Under 20.....	59	21	5											85
20 to 25.....	304	665	112	7	2	1								1,091
25 to 30.....	100	458	310	55	10	4	2							939
30 to 35.....	25	128	134	82	16	7	1	1						394
35 to 40.....	5	47	58	44	37	9	3							203
40 to 45.....	2	11	29	31	27	25	5	2						132
45 to 50.....		5	16	13	18	7	7	1						67
50 to 55.....	2	1	2	7	8	6	10	5	4	1				46
55 to 60.....			2	4	5	9	4	2	2					28
60 to 65.....			1	2	1	2	1	1		2		1		11
65 to 70.....				1	2	4	4	1	1	1	4			18
70 to 75.....							1	1	1	2	1			6
75 to 80.....					1	1								2
Number of Brides.....	497	1,336	669	246	127	75	38	14	8	6	5	1		3,022

The same results, in relation to numbers only, in the different age periods, may be presented in a different and perhaps clearer way as follows :

TABLE XXXV.

1888.	Under 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 65.	65 to 70.	70 to 75.	75 to 80.	80 to 85.	85 to 90.	Not stated.
Males.....	85	1,091	939	394	203	132	67	46	28	11	18	6	2	...	...	.
Females.....	497	1,336	669	216	127	75	38	14	8	6	5	1	...	...	...	...
Total persons.....	582	2,427	1,608	640	330	207	105	60	36	17	23	7	2	...	...	...

In Table XXXIV, as among the curiosities of matrimonial alliances, may be found the record of three grooms, aged from 20 to 25, who took brides aged from 35 to 45, and one groom of from 30 to 35 whose spouse was from 50 to 55.

The whole number of persons in each division of ages, of both sexes, married in Rhode Island in each of the last twenty-three years, that is, from 1866 to 1888 inclusive, is presented in Table XXXVI, on the following page :

TABLE XXXVI.

YEARS.	Under 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 65.	65 to 70.	70 to 75.	75 to 80.	80 to 85.	85 to 90.	Not stated.
1866	693	1,931	1,025	419	213	127	81	59	25	21	12	1	....	....	....	23
1867	696	1,886	1,104	416	211	148	91	48	37	18	18	5	3	1	....	9
1868	644	1,835	1,050	432	219	133	82	61	30	29	11	8	4	....	....	32
1869	642	1,814	1,051	468	227	131	79	46	35	15	11	2	3	2	....	49
1870	744	1,883	1,084	415	216	159	86	64	26	24	12	3	2	....	....	6
1871	697	1,914	1,118	392	238	115	73	56	35	22	6	7	3	....	....	6
1872	786	2,073	1,182	434	237	131	81	61	43	21	13	6	1	....	....	5
1873	762	2,177	1,156	507	253	140	87	68	35	24	12	6	6	....	....	27
1874	770	1,992	1,179	459	268	159	101	52	36	39	8	9	1	....	....	9
1875	681	2,058	1,108	475	252	150	101	60	32	29	13	4	1	....	....	6
1876	691	1,741	1,041	450	234	154	80	53	27	19	12	1	2	....	....	9
1877	631	1,745	1,118	459	244	125	92	52	46	14	15	11	2	1	....	9
1878	618	1,832	1,123	441	259	162	74	49	39	20	17	2	4	....	....	8
1879	639	1,879	1,156	481	272	123	78	56	39	26	18	9	2	2	1	11
1880	688	2,301	1,262	556	329	163	91	65	33	27	15	3	3	1	....	1
1881	599	2,208	1,410	547	298	187	107	54	31	31	16	5	1	1	....	2
1882	498	2,125	1,377	563	301	161	102	57	36	27	11	5	3	2	....	....
1883	497	2,108	1,370	486	319	183	115	73	31	20	14	3	2	1	....	....
1884	484	2,027	1,289	569	307	152	114	64	48	30	23	6	3	....	....	....
1885	438	1,973	1,296	540	309	163	102	57	45	27	13	7	3	....	1	2
1886	505	2,133	1,552	603	283	174	103	73	24	26	18	5	1	....	....	....
1887	501	2,308	1,552	607	294	162	114	49	39	23	19	7	3	....	....	....
1888	582	2,427	1,608	640	330	207	105	60	36	17	23	7	2	....	....	....

The following summary will show the number of persons married, the number of persons married under twenty years of age, and the percentages of marriages of persons under twenty years of age, during three periods of five years each, that is, from 1870 to 1884, inclusive, and during the years 1885, 1886 and 1887, and in 1888:

	Number of persons married.	Number married under twenty years of age.	Percentage of persons married under twenty years of age.
1870 to 1874	24,812	3,759	15.2
1875 to 1879	23,480	3,260	13.9
1880 to 1884	26,644	2,766	10.4
1885-1887	16,154	1,441	8.9
1888	6,044	582	9.6

In the following Table will be found the number and proportion of the persons married under 20 years of age, of both sexes, in seven periods of five years each, from 1854 to 1888, inclusive, and for the whole period of thirty-five years :

TABLE XXXVII.

5-YEAR PERIODS.	Total number of persons married.	Persons married under 20.	Percentage under 20.
1854-1858.....	13,842	1,932	13.95
1859-1863.....	16,042	2,500	15.58
1864-1868.....	21,374	3,019	14.26
1869-1873.....	21,308	3,631	14.93
1874-1878.....	23,770	3,391	13.84
1879-1883.....	26,320	2,921	11.09
1884-1888.....	27,314	2,510	9.19
35 years, 1854-1888.....	152,970	19,934	13.03

PROPORTION OF SEX.

The following Table will show the percentages of GROOMS in each division of ages, in each of the last twenty-nine years :

TABLE XXXVIII.

YEARS.	Under 20.	20 to 25.	25 to 30.	30 to 40.	40 to 50.	50 & over.	Total.
1860.....	5.0	42.8	26.9	16.3	5.7	3.3	100.0
1861.....	4.6	44.5	25.4	15.5	5.8	4.2	100.0
1862.....	4.2	37.8	27.9	18.3	5.9	5.9	100.0
1863.....	3.5	38.0	29.6	17.2	5.8	5.9	100.0
1864.....	4.3	38.8	27.3	17.9	7.4	4.3	100.0
1865.....	3.5	37.0	28.4	18.9	7.5	4.7	100.0
1866.....	5.3	40.9	27.0	16.4	6.3	4.1	100.0
1867.....	4.3	40.1	27.9	16.8	6.8	4.1	100.0
1868.....	4.1	39.9	28.2	17.1	6.1	4.6	100.0
1869.....	4.3	39.6	27.7	18.5	6.1	3.8	100.0
1870.....	4.8	40.4	28.1	16.0	6.4	4.3	100.0
1871.....	5.3	40.1	28.9	16.5	4.9	4.3	100.0
1872.....	4.3	41.3	28.2	16.6	5.2	4.4	100.0
1873.....	3.8	42.4	26.7	17.0	6.0	4.1	100.0
1874.....	4.1	40.4	27.2	17.5	6.4	4.4	100.0
1875.....	3.5	40.9	27.8	17.6	6.1	4.2	100.0
1876.....	5.1	37.5	28.6	17.9	5.6	4.3	100.0
1877.....	4.3	36.0	30.2	18.7	5.9	6.9	100.0
1878.....	3.9	38.5	29.0	18.0	6.3	4.3	100.0
1879.....	3.9	37.8	28.8	19.3	5.4	4.8	100.0
1880.....	3.6	38.9	27.5	19.9	5.8	4.3	100.0
1881.....	2.8	37.2	29.7	19.5	6.8	4.0	100.0
1882.....	2.2	36.0	31.4	20.0	6.1	4.3	100.0
1883.....	2.9	36.2	31.7	17.7	7.2	4.3	100.0
1884.....	2.5	36.2	29.1	21.0	6.2	5.0	100.0
1885.....	2.6	34.7	30.2	20.9	6.8	4.8	100.0
1886.....	2.5	35.2	31.9	19.6	6.8	4.0	100.0
1887.....	1.7	37.1	31.6	19.6	6.2	3.8	100.0
1888.....	2.8	36.1	31.1	19.8	6.5	3.7	100.0

GROOMS.

The following Table will show the percentages of BRIDES in each division of ages, in each of the last twenty-nine years :

TABLE XXXIX.

YEARS.		Under 20.	20 to 25.	25 to 30.	30 to 40.	40 to 50.	50 & over.	Total.
BRIDES.	1860.....	25.8	44.1	17.0	9.1	2.6	1.4	100.0
	1861.....	29.6	42.0	15.2	7.8	4.1	1.3	100.0
	1862.....	24.9	41.3	16.7	11.8	4.1	1.2	100.0
	1863.....	24.9	42.6	16.9	9.8	4.1	1.7	100.0
	1864.....	24.2	43.4	17.8	10.3	2.9	1.4	100.0
	1865.....	22.6	43.3	19.1	11.0	3.5	1.5	100.0
	1866.....	24.7	42.9	17.4	11.0	2.7	1.3	100.0
	1867.....	25.4	40.5	19.3	10.0	3.4	1.4	100.0
	1868.....	24.4	40.9	18.1	11.6	3.3	1.7	100.0
	1869.....	24.1	40.5	18.7	12.1	3.4	1.2	100.0
	1870.....	26.8	39.4	17.9	10.8	3.9	1.2	100.0
	1871.....	24.6	41.9	19.1	10.1	3.1	1.2	100.0
	1872.....	26.7	40.5	18.4	9.9	2.2	1.3	100.0
	1873.....	25.3	40.8	17.5	12.0	2.7	1.7	100.0
	1874.....	26.3	38.1	19.3	11.1	3.9	1.3	100.0
	1875.....	23.9	42.1	16.8	11.8	4.0	1.4	100.0
	1876.....	25.6	39.8	17.6	12.0	3.7	1.3	100.0
	1877.....	23.4	40.4	18.8	12.1	3.6	1.7	100.0
	1878.....	22.7	40.4	19.3	12.2	3.8	1.6	100.0
	1879.....	22.8	40.7	19.4	12.1	3.0	2.0	100.0
	1880.....	21.1	44.2	18.0	12.0	3.3	1.4	100.0
	1881.....	19.0	43.0	21.5	11.2	3.8	1.5	100.0
	1882.....	16.7	44.8	20.9	12.6	3.9	1.1	100.0
	1883.....	16.2	44.2	20.6	13.2	4.3	1.5	100.0
	1884.....	16.4	43.0	21.3	13.2	4.2	1.9	100.0
	1885.....	14.9	44.6	21.8	13.2	3.8	1.7	100.0
	1886.....	15.8	42.4	24.5	12.5	3.3	1.5	100.0
	1887.....	15.9	44.1	22.8	12.1	3.5	1.6	100.0
1888.....	16.4	44.3	22.1	12.4	3.7	1.1	100.0	

It will be noticed, in the preceding Tables, that the proportions of persons married of both sexes, under twenty years of age, largely decreased during the last two decades, with a slight increase in the class of males in 1888, and a rather larger increase in the class of females.

Of males, the proportion has decreased about 40 per cent., and of females about 30 per cent., the increase during 1888 not materially changing the results of previous years.

The proportion of males married, between the ages of twenty and twenty-five, has decreased about 12 per cent., and has correspondingly increased in the more advanced age periods.

The proportion of females married, between twenty and twenty-five years of age, has continued about the same, while of those between twenty-five and forty there has been an increase of proportion similar to that of males.

There has been an increase of about one year in the average age of the males who were married during the ten years 1879 to 1888, inclusive, over the average age of the males who were married during the ten years 1859 to 1868, inclusive. The average age of the females married, during the same periods, increased about one and one-half years during the last ten.

NUMBER OF TIMES MARRIED.

There will be found in the following Table the number of grooms and of brides who were married for the first, second, third, etc., time, in 1888:

TABLE XL.

	First Marriage.	Second Marriage.	Third Marriage.	Fourth Marriage.	Fifth Marriage.	Total.
Grooms.....	2,536	448	33	5	.....	3,022
Brides.....	2,692	305	22	3	.....	3,022

The proportion of *grooms* married for the first time, in 1888, was 83.9 per cent. of the whole number, and the proportion of *brides* married for the first time was 89.1 per cent.

The following Table will show not only the number of times each of the parties was married, but also the number of bachelors and widowers who married spinsters, the number who married widows of first or second widowhood, and of spinsters and widows who married bachelors, and widowers of the second, third or fourth marriage:

TABLE XLI.

GROOMS.	BRIDES.					Total, Grooms.
	First.	Second.	Third.	Fourth.	Fifth.	
First marriage.....	2,394	135	6	1	.....	2,536
Second marriage	284	151	13	1	.....	448
Third marriage	12	17	3	1	.....	33
Fourth marriage.....	2	2	.....	.....	.....	5
Fifth marriage.....	.....	.....	.....	.....	.....	.....
Total, Brides.....	2,692	305	22	3	.....	3,022

It will be seen, by Table XLI, that 142 bachelors married widows, 7 of whom married brides that had been twice or thrice widowed. Of the 486 widowers who married in 1888, 298 married spinsters, and 188 married widows. Of the widows who married widowers, 16 had been twice married previously, and three married for the fourth time.

MARRIAGES OF PERSONS OF COLOR.

The number of marriages of persons of color, in Rhode Island, in 1888, was 69. This includes four marriages in which one of the parties was white. The number and color of the individuals were, therefore, 134 persons of color and 4 persons white. The white persons were females. The marriages, however, may be properly classed as colored marriages, inasmuch as the offspring of such marriages are persons of color.

The number reported during 1888, from the different towns, was as follows, viz.:

Providence (including four white brides).	47
Newport City.	8
South Kingstown.....	5
East Greenwich.....	2
Bristol,	} each 1..... 7
East Providence,	
North Kingstown,	
Pawtucket,	
Scituate,	
Warwick,	
Westerly,	
Total.....	69

MARRIAGES OF THE DIVORCED.

The following Table will give the names of the towns from which returns of marriage with the facts of divorce were reported during 1888, the whole number of marriages and of divorced persons married, also whether the second or third marriage of the divorced groom or bride, and number of re-marriages of same persons :

TABLE XLII.

TOWNS.	Number of Mar- riages.	Whole Number Married.	Groom.	Bride.	Second Marriage of Groom.	Third Marriage of Groom.	Second Marriage of Bride.	Third Marriage of Bride.	Remarriages, Same Parties.
Providence City.....	80	87	40	47	38	2	44	3	3
Woonsocket.....	6	7	4	3	3	1	3	.....	.....
Westerly.....	4	4	1	3	1	.....	3	.....	.....
Burrillville.....	1	1	.....	1	.....	.....	1	.....	.....
Cranston.....	1	1	1	.....	1	.....	.....	.....	.....
Total State.....	92	100	46	54	43	3	51	3	3

There were 92 marriages, in 1888, in which one or both of the parties had been divorced, and in 8 of which both parties had been divorced. Of the 8 marriages where both parties had been divorced, 3 were re-marriages of the same persons.

The proportion of the *number of marriages*, of which one or more of the parties had been divorced, to the whole number of marriages, was about one in every 33, or about 3.0 per cent.

But the proportion of divorced *persons* married during 1888, to the whole number of persons married in the same year, was about one in every 60, or 1.6 per cent.

The number of divorced persons married in 1888 was 15 less than in the previous year.

DIVORCES, 1888.

According to the returns made to the Secretary of the State Board of Health by the clerks of the Supreme Courts of the different counties in Rhode Island, the number of applications for divorce, during 1888, was three hundred and four (304).

The number of divorces granted, during 1888, was two hundred and twenty-four (224).

There were eighteen less applications, during 1888, than during the preceding year, and the number of divorces granted was twenty-four less.

Divorces are decreed for the following seven statute causes, viz.:

1. Adultery.
2. Extreme cruelty.
3. Wilful desertion for five years of either of the parties, or for a shorter period, in the discretion of the court.
4. Continued drunkenness.
5. Neglect or refusal to provide necessaries (having ability) for the subsistence of a wife.
6. Gross misbehavior and wickedness other than aforesaid.
7. Impotency.

Divorces are also decreed, or marriages set aside, in the discretion of the court, for ascertained affinity, consanguinity, idiocy, insanity, penitentiary crimes, and bigamous or otherwise illegal marriage.

The following Table shows the number of applications for divorce, and the number granted, in 1888, in each county of the State; also the causes alleged for the applications :

TABLE XLIII.

COUNTIES.	Number of Applications.	Number Granted.	CAUSES ALLEGED.								Total Causes Alleged.
			Adultery.	Extreme Cruelty.	Willful Desertion.	Continued Drunkenness.	Neglect to Provide Necessaries, &c.	Other Gross Misbehavior.	Impotency.	Illegal Marriage.	
Bristol.....	6	5	.....	1	3	1	1	.....	.....	.....	6
Kent.....	20	14	3	3	7	1	7	.....	.....	.....	21
Newport.....	8	4	1	2	3	1	4	3	.....	.....	14
Providence.....	244	188	43	55	139	63	162	36	1	.....	499
Washington.....	26	13	4	3	8	1	9	.....	1	.....	26
Whole State	304	224	51	64	160	67	183	39	2	.....	566

There were, during the year 1888, three hundred and four (304) applications for divorce, and the whole number of causes alleged was five hundred and sixty-six (566). There were, therefore, an average of less than two causes alleged in each application. That average is not far from the rule of many years.

The causes alleged why divorce should be granted, in the applications during 1888, were 112 less in number than in 1887.

In order to show the actual number of applications, and the number of divorces granted in each of the last sixteen years, the following summary is presented :

	Applications for Divorce.	Divorces Granted.	Applications refused or continued or withdrawn.
1873.....	261.....	173.....	88
1874.....	276.....	242.....	34
1875.....	227.....	158.....	69
1876.....	254.....	196.....	58
1877.....	257.....	178.....	79
1878.....	258.....	196.....	58
1879.....	255.....	246.....	9
1880.....	347.....	273.....	74
1881.....	350.....	268.....	82
1882.....	330.....	271.....	68
1883.....	321.....	257.....	64
1884.....	320.....	266.....	54
1885.....	293.....	227.....	66
1886.....	336.....	257.....	70
1887.....	322.....	248.....	74
1888.....	304.....	224.....	80
<hr/>			
16 years, total...	4,720	3,680	1,040

During the last sixteen years the proportion of decrees of divorce, to whole number of applications, was 78 per cent. During 1883 it was 80 per cent., during 1884 it was 83 per cent., during 1885 it was 78.5 per cent., during 1886 it was 76.5 per cent., during 1887 it was 77 per cent., and during 1888 it was 73.6 per cent.

The proportion of *divorces granted*, in 1888, to the whole number of marriages during the same year, was *one divorce* to every thirteen and five-tenths marriages.

The proportion of *applications for divorce* to whole number of marriages, during the year, was one *application* to about every ten marriages.

The following Table shows the number of divorces granted in each county, and in the whole State, in each of the last twenty years, and the proportion of marriages to each divorce granted in each year:

TABLE XLIV.

YEARS.	Bristol County.		Kent County.		Newport County.		Providence County.		Washington County.		Whole State.	
	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.	Divorces Granted.	Marriages to one Divorce.
1869.....	10	10.6	15	12.5	6	27.7	120	13.8	11	15.5	162	14.1
1870.....	3	27.7	18	11.8	6	26.3	152	11.3	21	9.3	200	11.8
1871.....	5	16.8	11	17.9	4	49.7	123	13.3	18	11.4	161	14.5
1872.....	8	10.2	13	15.7	8	22.9	149	12.6	22	8.9	200	12.7
1873.....	6	16.2	22	9.8	8	21.9	131	14.8	6	33.7	173	15.2
1874.....	10	8.9	20	8.0	6	29.0	190	10.0	16	11.6	242	10.5
1875.....	2	50.0	18	8.8	7	23.4	120	14.9	11	20.5	158	15.7
1876.....	6	14.5	15	12.8	7	20.5	148	11.1	20	8.8	190	11.5
1877.....	7	12.0	9	16.3	7	26.0	134	12.4	21	9.9	178	12.8
1878.....	4	26.0	11	13.3	13	12.8	156	10.9	12	17.3	196	11.9
1879.....	5	18.8	19	9.0	7	24.1	195	9.1	20	9.7	246	9.7
1880.....	8	12.1	23	9.4	11	17.6	208	9.7	23	17.0	273	10.1
1881.....	6	20.1	26	7.3	10	16.9	207	10.0	19	11.0	268	10.4
1882.....	6	15.0	18	10.3	15	13.0	221	8.9	11	16.2	271	9.7
1883.....	6	15.8	15	11.5	9	21.2	214	9.2	13	13.3	257	10.2
1884.....	4	16.7	20	8.0	12	15.7	209	9.3	21	8.2	266	9.6
1885.....	3	23.0	9	18.6	17	11.2	186	10.1	12	15.0	227	11.0
1886.....	5	16.0	17	11.0	15	12.3	194	10.9	26	7.3	257	10.7
1887.....	1	75.0	23	8.0	13	13.4	187	11.8	24	7.9	248	11.4
1888.....	5	15.8	14	13.5	4	46.0	188	12.5	13	16.5	224	13.5

The ratio of divorces granted in the entire State, during 1888, to the whole number of marriages during the same year was one divorce to about every thirteen and five-tenths marriages, as previously stated.

During the ten years 1869 to 1878, inclusive, the ratio of divorce to number of marriages was one divorce to every thirteen; during the ten years 1879 to 1888, inclusive, the ratio was one divorce to every ten and six-tenths marriages.

The average of the last four years was one divorce to every eleven and six-tenths marriages.

The small number of applications for divorce granted in Newport county will not fail to be noticed. The proportion of only one to every forty-six marriages, in 1888, has not been equalled or approached

but once in twenty years. The average of the last twenty years, in Newport county, is one divorce to every twenty-two and five-tenths of the marriages.

The difference in the other counties is not remarkable.

During the twenty years 1869-1888 the average proportions of divorce to marriage, in the several counties and the State, have been as follows:

Bristol County.....	One divorce to every 20.1 marriages.
Kent County	One divorce to every 11.4 marriages.
Newport County.....	One divorce to every 22.5 marriages.
Providence County.	One divorce to every 11.4 marriages.
Washington County.....	One divorce to every 13.8 marriages.
Whole State.....	One divorce to every 11.9 marriages.

The following Table will show the Number of Marriages to every Decree of Divorce, in five of the New England States, during the thirteen years from 1876 to 1888, inclusive:

TABLE XLV.

STATES.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.
Rhode Island.....	11.5	12.8	11.9	9.7	10.1	10.4	9.7	10.2	9.6	11.0	10.7	11.4	13.5
Massachusetts.....	24.2	23.1	21.4	23.4	26.8	40.9	34.3	27.8	28.2	26.4	30.0	24.5	15.7
Connecticut.....	10.9	10.1	10.7	13.4	13.9	11.6	12.8	12.1	14.9	13.3	14.2	14.9	.....
Vermont.....	16.0	15.0	14.0	21.0	20.0	16.0	17.8	16.4	.....	.....	20.0	13.5	.....
New Hampshire.....	.....	.....	.....	.....	7.7	9.2	10.9	12.8	10.4	10.9	8.3	10.7	.....

It was intended by the State Registrar to give, in tabulated form, and for each county, some other facts of interest in connection with the applications for divorce in Rhode Island, during 1888, facts which are now taken quite largely into account in the consideration of the subject of divorce.

The clerks of the Supreme Courts (with the exception of the clerk of the Supreme Court in Providence county, who declined) courteously, as was reasonably to be expected, furnished the desired information. As Providence county has considerably more than half of the divorce cases in the State, the omission of that county in any divorce statistics would invalidate all the rest.

Such statistics are furnished by the clerks of the Supreme Courts in other States.

DEATHS, 1888.

The number of deaths registered in Rhode Island, during 1888, according to the returns made to the State Registrar, was six thousand, five hundred and ninety-four (6,594).

This number is larger by 254 than that of the year 1887, and an increase of 745 over that of 1886. It is the largest ever recorded in the State.

The death rate (twenty and four-tenths in every 1,000 living persons) was about five tenths in excess of that of the previous year, and about two and seven-tenths in excess of the census year, 1885.

The following summary will show the death rates per 1,000 for each of the last seven census years, in comparison with 1887 and 1888 :

1860.	1865.	1870.	1875.	1880.	1885.	1887.	1888.
15.4	18.4	14.9	16.7	17.5	17.7	19.9	20.4

On the following page will be found the death rates, by counties, for twenty-nine years :

TABLE XLVI.

Death rates per 1,000 living, by counties, in each of twenty-nine years, from 1860 to 1887, inclusive; also the average rate of each period of five years each, from 1860 to 1884, inclusive, for the whole State.

YEARS.	Bristol.	Kent.	Newport.	Providence.	Washington.	State.	STATE. ANNUAL AVERAGE OF FIVE-YEAR PERIODS, 1860-1884.
1860	16.4	13.7	13.7	17.7	12.6	15.4	...16.5 per 1,000 living.
1861	18.9	17.5	16.9	16.9	14.1	16.8	
1862	13.8	14.6	13.1	15.1	10.6	14.3	
1863	13.0	13.0	27.5	18.9	10.5	18.1	
1864	20.2	18.1	19.6	18.5	12.8	18.1	
1865	22.8	16.1	17.5	19.2	14.2	18.4	...16.5 per 1,000 living.
1866	19.2	14.2	17.3	16.6	11.4	16.1	
1867	17.0	15.1	15.0	16.4	10.9	15.6	
1868	15.7	13.7	14.7	17.0	10.4	15.7	
1869	17.9	16.7	13.2	16.0	12.8	15.6	
1870	15.5	13.5	14.1	15.5	12.0	14.9	...17.2 per 1,000 living.
1871	16.3	17.5	12.2	15.9	12.3	15.4	
1872	21.1	16.1	14.5	21.2	14.7	19.1	
1873	18.4	13.8	19.0	22.0	15.1	20.2	
1874	14.7	13.2	10.8	17.7	13.7	16.3	
1875	14.9	14.9	13.5	17.5	15.5	16.7	...16.6 per 1,000 living.
1876	14.7	11.7	13.5	16.8	15.9	15.9	
1877	18.2	13.1	12.4	18.7	12.8	17.2	
1878	17.5	14.2	13.7	18.3	13.0	17.2	
1879	13.2	15.1	14.8	17.2	11.1	16.2	
1880	19.2	14.9	14.5	18.5	12.7	17.5	...18.0 per 1,000 living.
1881	17.9	16.5	15.7	19.3	11.9	18.1	
1882	16.5	15.3	17.2	19.7	11.0	18.4	
1883	17.7	14.6	17.7	20.8	9.8	19.1	
1884	17.7	17.1	14.5	17.8	12.6	16.9	
1885	16.3	16.4	14.5	18.5	14.0	17.7	
1886	19.2	17.5	15.0	19.2	15.0	18.8	
1887	18.2	15.5	15.1	21.1	15.5	19.9	
1888	21.3	18.4	18.0	21.0	16.0	20.4	

Annual average, twenty-five years, 1860-1884..... 17.0 per 1,000 living.

SEX OF DECEDENTS.

Of the 6,594 persons whose deaths were returned, during the year 1888, 3,199 were males, and 3,395 were females; the ratio standing at 106.1 males to each 100 females, or 485 males and 515 females in every 1,000 decedents.

The following Table will show the number and proportion of males and females among the *decedents* in Rhode Island, during the ten years 1853 to 1862, inclusive; also in each of the twenty-six years from 1863 to 1888, inclusive, and for the entire period of thirty-six years:

TABLE XLVII.

DEATHS.			
	Males.	Females.	Males to every 100 females.
10 years, 1853-1862.....	10,930.....	11,269.....	96.9
1863.....	1,621.....	1,586.....	102.2
1864.....	1,633.....	1,727.....	92.4
1865.....	1,686.....	1,719.....	98.1
1866.....	1,497.....	1,473.....	101.5
1867.....	1,442.....	1,447.....	99.7
1868.....	1,413.....	1,499.....	94.3
1869.....	1,696.....	1,686.....	100.6
1870.....	1,588.....	1,650.....	96.2
1871.....	1,621.....	1,723.....	94.1
1872.....	2,118.....	2,129.....	99.4
1873.....	2,166.....	2,237.....	95.5
1874.....	2,111.....	2,118.....	99.7
1875.....	2,108.....	2,209.....	95.4
1876.....	1,969.....	2,147.....	91.7
1877.....	2,132.....	2,318.....	92.0
1878.....	2,161.....	2,280.....	94.8
1879.....	2,183.....	2,289.....	95.4
1880.....	2,366.....	2,463.....	96.0
1881.....	2,367.....	2,559.....	96.8
1882.....	2,487.....	2,587.....	96.5
1883.....	2,627.....	2,655.....	99.0
1884.....	2,486.....	2,655.....	93.6
1885.....	2,607.....	2,782.....	93.7
1886.....	2,833.....	3,016.....	93.9
1887.....	3,177.....	3,163.....	100.4
1888.....	3,199.....	3,395.....	95.4
36 years.....	66,324.....	68,671.....	96.7

The following Table of births, during the same period of time as the preceding, will show by comparison the different proportions of the sexes in the two classes of events :

TABLE XLVIII.

BIRTHS.

	Males.	Females.	Males to every 100 females.
10 years, 1853-1862.....	18,377.....	17,260..	106.4
1863.....	1,892.....	1,788.....	105.8
1864.....	1,949.....	1,942.....	100.3
1865.....	2,096.....	1,857.....	112.9
1866.....	2,546.....	2,356.....	108.1
1867.....	2,655.....	2,464.....	107.7
1868.....	2,745.....	2,627.....	104.5
1869.....	2,685.....	2,560.....	104.9
1870.....	2,679.....	2,536.....	105.6
1871.....	2,878.....	2,800.....	102.8
1872.....	3,085.....	3,058..	100.9
1873.....	3,135.....	2,887.....	108.6
1874.....	3,311.....	3,155.....	104.9
1875.....	3,362.....	3,146.....	106.9
1876.....	3,291.....	3,038.....	108.3
1877.....	3,163.....	3,072..	103.0
1878.....	3,402.....	3,312.....	102.7
1879.....	3,259.....	3,091..	105.4
1880.....	3,211.....	3,054.....	106.1
1881.....	3,498.....	3,263.....	107.2
1882.....	3,509.....	3,316.....	105.8
1883.....	3,518.....	3,498.....	101.4
1884.....	3,713.....	3,592.....	103.4
1885.....	3,591.....	3,437.....	104.4
1886.....	3,897.....	3,721.....	104.6
1887.....	3,968.....	3,700.....	107.2
1888.....	4,023.....	3,817.....	105.4
36 years.....	99,498.....	96,350.....	106.8

SEASON AND MORTALITY.

The whole number of decedents, and the sex of the same, in each month of the year 1888, and in each division of the State, may be found in Table VI, on the ninth page.

The influence of season upon mortality may be further illustrated by the following Table, which shows the number and percentage of deaths in each quarter of each of the last four years, and in the aggregate for thirty-six years, 1853 to 1888, inclusive :

TABLE XLIX.

SEASONS.	1888.		1887.		1886.		1885.		1853-1888.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
January-March.....	1,709	25.92	1,448	22.84	1,413	24.16	1,433	26.59	31,928	23.63
April-June.....	1,496	22.69	1,412	22.27	1,297	22.17	1,337	22.95	28,792	21.31
July-September.....	1,911	28.99	1,887	29.76	1,745	29.83	1,575	29.22	39,087	29.01
October-December	1,478	22.40	1,593	25.13	1,394	23.84	1,144	21.24	35,288	26.05
Total.	6,594	100.00	6,340	100.00	5,849	100.00	5,389	100.00	135,095	100.00

Comparing the percentages of 1888 with those of the thirty-six years, we find the per cent. of the first quarter somewhat larger; the second quarter slightly greater, and the last quarter considerably smaller than the same for the average of the thirty-six years. The greatest mortality for any one season of any one year may be found in the third quarters of 1886 and 1887, as in the case of the general average.

TABLE L.
Showing the Months in the Order of Largest Mortality, for Eight Years.

1888.	1887.	1886.	1885.	1884.	1883.	1882.	1881.
1. August..... 722	July 651	August..... 644	July 587	August 532	July 537	August..... 589	August..... 576
2. July 646	August..... 647	July 589	August 518	October 518	August 499	November..... 461	January..... 430
3. January 615	September 589	March..... 515	March..... 499	September 514	April 475	September 444	July..... 434
4. March..... 582	December..... 554	September..... 512	January..... 492	December..... 457	January 455	July 410	October..... 436
5. September.. 543	October 520	October..... 512	April..... 483	July..... 456	May..... 452	May..... 406	April..... 417
6. October 536	November..... 519	January..... 488	September 470	November..... 432	October..... 443	December..... 405	September..... 414
7. April..... 536	March..... 517	April 460	February..... 442	April..... 416	March 442	April..... 401	May..... 410
8. February... 512	April..... 517	December..... 454	December..... 404	March 389	September.... 435	October..... 399	March..... 401
9. May..... 509	January 490	November..... 428	May.. .. 397	January..... 378	December..... 409	January 398	February..... 396
10. December.. 500	May 437	May..... 420	October..... 376	May..... 369	June..... 401	February..... 392	December..... 385
11. June, ... 461	February..... 441	June..... 417	November..... 364	February... .. 344	November 392	March..... 390	November 374
12. November.. 412	June..... 438	February..... 410	June... .. 357	June..... 326	February.... 352	June..... 379	June..... 344
6,594	6,340	5,849	5,389	5,141	5,282	5,074	5,016

PARENTAGE OF DECEDENTS.

The number of decedents, in 1888, of the two general classes of parentage, that is, American and foreign, may be found in Table I, on pages 2 and 3.

Of the whole number of decedents, 6,594, reported in 1888, 3,043 were of American, and 3,551 were of foreign parentage.

By the term "foreign parentage" is meant the decedents whose fathers were born in some other country and not in the United States. The grandchildren of foreign born grandfathers are reckoned as of American parentage, if their fathers were born in the United States.

The following fourteen towns reported a larger number of decedents of foreign parentage than of American, namely: Barrington, Warren, Warwick, Tiverton, Burrillville, Cumberland, Johnston, Lincoln, North Providence, Pawtucket, Providence, Smithfield and Woonsocket; also the State Institutions at Cranston. These fourteen towns give the following proportions of foreign parentage over American:

Barrington.....	123 of foreign parentage to each 100 of American.
Burrillville..	146 of foreign parentage to each 100 of American.
Cranston (State Institutions).....	169 of foreign parentage to each 100 of American.
Cumberland.....	186 of foreign parentage to each 100 of American.
Johnston.....	109 of foreign parentage to each 100 of American.
Lincoln.....	362 of foreign parentage to each 100 of American.
North Providence.....	111 of foreign parentage to each 100 of American.
North Smithfield.....	121 of foreign parentage to each 100 of American.
Pawtucket.....	160 of foreign parentage to each 100 of American.
Providence City.....	137 of foreign parentage to each 100 of American.
Smithfield.....	105 of foreign parentage to each 100 of American.
Tiverton.....	132 of foreign parentage to each 100 of American.
Warren.....	121 of foreign parentage to each 100 of American.
Warwick.....	122 of foreign parentage to each 100 of American.
Woonsocket.....	298 of foreign parentage to each 100 of American.

The following Table gives the number and proportion in every one thousand deaths of decedents of American and of foreign parentage, in each of the last five years; and in the aggregate for thirty years, or from 1858 to 1887, inclusive:

TABLE II.

PARENTAGE.	1888.		1887.		1886.		1885.		1884.		30 years. 1858-1887.	
	Number.	Per 1,000.	Number.	Per 1,000.	Number.	Per 1,000.	Number.	Per 1,000.	Number.	Per 1,000.	Number.	Per 1,000.
American.....	3,043	461.5	2,926	461.5	2,747	469.7	2,765	513.8	2,485	483.4	73,335	539.4
Foreign.....	3,551	538.5	3,414	538.5	3,102	530.3	2,624	486.2	2,656	516.6	62,619	460.6
Total.....	6,594	1000.0	6,340	1000.0	5,849	1000.0	5,389	1000.0	5,141	1000.0	135,954	1000.0

AGE OF DECEDENTS.

In Table I, on pages 2 and 3, may be found the aggregate and average age of all the decedents whose deaths occurred in 1888, and with the age of each sex, in each town and county in the State.

By that Table it will be seen that the average age of all the male decedents in the State, in 1888, was 33.17 years, and that the average age of all the female decedents, in the same year, was 35.74 years; the average age of all decedents, of both sexes, 34.53 years.

The average age of all the decedents in the State, in 1888, was over two years more than the average for 1887.

The following Table will present, separately, the average age of the male and female decedents, and the average age of all decedents, in each year for twenty-nine years; also the average age in five periods of five years each, from 1860 to 1884, inclusive:

TABLE LII.

YEARS.	Average Age of Males.	Average Age of Females.	Average Age of All.	Average Age, 5-year periods, 1860-1884.
1860.....	28.51	30.70	29.61	} 29.71
1861.....	26.95	30.58	28.83	
1862.....	29.64	32.65	31.15	
1863.....	28.99	30.86	29.56	
1864.....	28.13	30.43	29.40	} 31.58
1865.....	26.98	28.97	27.69	
1866.....	31.13	35.07	33.09	
1867.....	32.16	35.86	34.01	
1868.....	30.47	35.08	32.85	} 30.30
1869.....	28.62	31.29	30.25	
1870.....	31.02	32.75	31.90	
1871.....	32.57	34.43	33.52	
1872.....	28.41	31.15	29.77	} 31.29
1873.....	26.18	28.62	27.42	
1874.....	28.03	31.66	28.86	
1875.....	29.72	32.75	31.27	
1876.....	31.47	33.21	32.37	} 33.24
1877.....	29.25	31.56	30.45	
1878.....	29.02	31.11	30.09	
1879.....	31.29	33.24	32.29	
1880.....	29.62	32.06	30.86	} 33.75
1881.....	30.99	34.07	32.55	
1882.....	31.33	35.57	33.50	
1883.....	33.64	37.44	35.55	
1884.....	32.29	35.12	33.76	} 33.75
1885.....	33.53	35.60	34.59	
1886.....	33.02	34.91	34.01	
1887.....	30.97	32.91	31.95	
1888.....	33.17	35.74	34.53	

The above Table shows that the average longevity of the decedents in Rhode Island increased over three years, during a period of twenty-five years, ending with 1884, and of four years increase, as the average of the last four years.

The following Table will present some of the facts of the preceding as occurring in the different divisions of the State, as well as of the State at large. It will show the average age of the decedents in each of the larger divisions of the State, in each of the last four years, and also the average of each of six periods of five years each, comprising the thirty years from 1858 to 1887, inclusive :

TABLE LIII.

DIVISIONS OF THE STATE.	1888.	1887.	1886.	1885.	1883-1887, 5 years.	1878-1882, 5 years.	1873-1877, 5 years.	1868-1872, 5 years.	1863-1867, 5 years.	1858-1862, 5 years.
Bristol County.....	35.53	33.20	40.04	42.14	38.45	36.68	33.61	35.12	34.78	35.56
Kent County.....	32.78	39.15	33.83	34.78	37.06	37.11	36.20	34.77	35.81	32.15
Newport County.....	39.93	37.15	50.00	44.08	42.41	39.21	40.68	40.04	33.54	35.01
*Providence County.....	30.49	29.60	30.07	32.41	31.83	30.60	28.46	25.26	29.16	28.44
Providence City.....	34.83	30.00	32.45	33.81	32.19	29.50	27.19	25.45	28.50	25.78
Washington County.....	44.37	40.70	44.12	42.61	43.39	41.01	41.14	39.67	30.87	34.21
Whole State.	34.53	31.95	34.01	34.59	33.97	31.86	30.28	31.66	30.73	29.42

PERCENTAGE OF DECEDENTS BY DIFFERENT AGES.

In Table VI, on pages 10 to 15, inclusive, will be found the number of deaths in 1888, in each town and each county, of each sex, and in each period of life, with the percentage of the whole number of deaths in each division to the population of the same, as estimated by the authorities of each.

The following Table shows the percentages of decedents in each division of ages, to whole number of deaths, in each of the last six years, and in the aggregate for three periods ; one of ten years and seven months, from June 1st, 1852, to December 31st, 1862, inclusive ; one of ten years, from 1863 to 1872, inclusive ; and one of ten years, from 1873 to 1882, inclusive :

* Exclusive of Providence City.

TABLE LIV.

PERIODS OF LIFE.	1888.	1887.	1886.	1885.	1884.	1883.	10 years, 1873 to 1882.	10 years, 1863 to 1872.	10 years, 7 months, 1852 to 1862.
Under 1 year.....	19.3	19.6	19.9	18.8	20.1	18.1	18.9	18.0	17.6
1 and under 2	5.9	6.6	5.3	5.2	5.6	5.1	7.6	7.8	9.8
2 and under 5	6.6	8.2	6.5	6.1	6.6	4.1	8.4	7.9	9.6
Total under 5.....	31.8	34.4	31.7	30.1	32.3	27.6	34.9	33.7	37.0
5 and under 10.....	4.2	5.2	4.0	3.3	3.5	3.4	5.0	4.6	5.0
10 and under 20.....	5.7	5.1	5.5	5.6	4.8	5.4	5.8	6.2	5.8
20 and under 30.....	9.0	7.6	8.7	8.6	9.2	10.3	9.2	9.7	9.5
30 and under 40.....	7.5	7.0	7.5	7.9	8.1	8.4	7.8	8.1	8.7
40 and under 50.....	7.9	6.7	7.4	7.7	7.2	7.6	6.9	7.2	7.5
50 and under 60.....	8.4	8.0	8.1	8.1	8.1	9.0	7.2	7.3	6.7
60 and under 70.....	9.5	9.9	9.1	10.4	9.1	9.2	8.2	8.3	6.9
70 and under 80.....	9.0	9.2	10.6	10.4	9.5	10.5	8.8	8.4	7.3
80 and under 90.....	5.6	5.3	5.3	6.2	6.9	6.5	5.1	5.4	4.6
Over 90 and not stated..	1.4	1.6	2.1	1.7	1.3	2.1	1.1	1.1	1.0
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

There was a slight decrease in the proportional number of deaths in all the divisions of age under ten years, in the percentage to the whole number in 1888. Under five years the percentage was two and six-tenths less than the year previous. But this proportion was three and four-tenths less than the average of thirty years previous to 1883.

Above the age of ten years the proportionate mortality was somewhat larger in nearly every period.

The rule for several years, however, has been an increased percentage of mortality in the divisions of age above fifty.

The following Table will present the varying proportions of deaths to whole number of deaths, in four different periods of life, from 50 years of age to 90 years, grouped in three periods of ten years each, and one period comprising the five years, 1883-1887:

TABLE LV.

AGE OF DECEDENTS.	1st Decade. 1852-1862.	2d Decade. 1863-1872.	3d Decade. 1873-1882.	5 Years, Ending 1887.
50 to 60	6.7 per cent.	7.3 per cent.	7.2 per cent.	8.2 per cent.
60 to 70	6.9 "	8.3 "	8.2 "	9.5 "
70 to 80	7.3 "	8.4 "	8.8 "	10.0 "
80 to 90	4.6 "	5.4 "	5.1 "	6.0 "

It has been elsewhere observed that the natural result of a lessened proportion of deaths in the earlier periods of life would be a larger proportion of living persons in the later periods, and consequently an increased death rate in those periods, because of the larger proportional number liable to disease and other causes of death.

COLORED DECEDENTS.

The number of deaths of colored persons in Rhode Island, during 1888, was 200. They occurred in the different towns as follows :

Providence City	130	
Newport City.....	29	
Warwick.....	6	
State Institutions	4	
Burrillville,	} 3 each.....	15
East Providence,		
Hopkinton,		
South Kingstown,		
Richmond.		
Bristol,	} 2 each	12
East Greenwich,		
Pawtucket,		
Charlestown,		
North Kingstown,		
Narragansett.		
North Smithfield,	} 1 each	4
Lincoln,		
Cranston,		
Tiverton.		
Total		200

Sex.—Of the decedents of color, 90 were males, and 110 were females.

Season.—The deaths were in the different months as follows :

Months.	Deaths.	Months.	Deaths.	Months.	Deaths.	Months.	Deaths.
January.....	19	April.....	11	July.....	14	October.....	21
February.....	12	May.....	17	August.....	28	November.....	7
March.....	14	June.....	25	September.....	17	December.....	15
	—		—		—		—
First Quarter.....	45	Second Quarter.....	53	Third Quarter.....	59	Fourth Quarter.....	43

First six Months, 98; Second six months, 102; Total, 200.

The following summary will show the proportion, to the whole estimated colored population, of each of the events of birth, marriage and death of colored persons, during the eleven years from 1878 to 1888, inclusive :

	One Birth in every	One Person married in every	One Death in every
1878.....	36.4.....	39.2.....	40.2.....
1879.. ..	39.6.....	51.4.....	37.3.....
1880.....	47.1.....	43.3.....	44.0.....
1881.....	34.3.....	39.2.....	35.4.....
1882.....	36.8.....	44.5.....	45.4.....
1883.....	33.4.....	63.3.....	39.7.....
1884.....	34.8.....	46.0.....	34.5.....
1885.....	36.7.....	51.7.....	40.1.....
1886.....	34.6.....	43.2.....	37.8.....
1887.....	35.8.....	38.9.....	37.2.....
1888.....	37.6.....	55.0.....	38.0.....

In every one thousand of the colored population there were, in 1888,

Of Births.	Married.	Of Deaths.
26.6.....	18.2.....	26.3.....

The following exhibit will show the number of births, marriages and deaths among the colored population of Rhode Island, during 10 years, from 1861 to 1870, inclusive; 10 years, from 1871 to 1880, inclusive; and for the last seven years, from 1880 to 1888, inclusive, as well as the aggregate of the same :

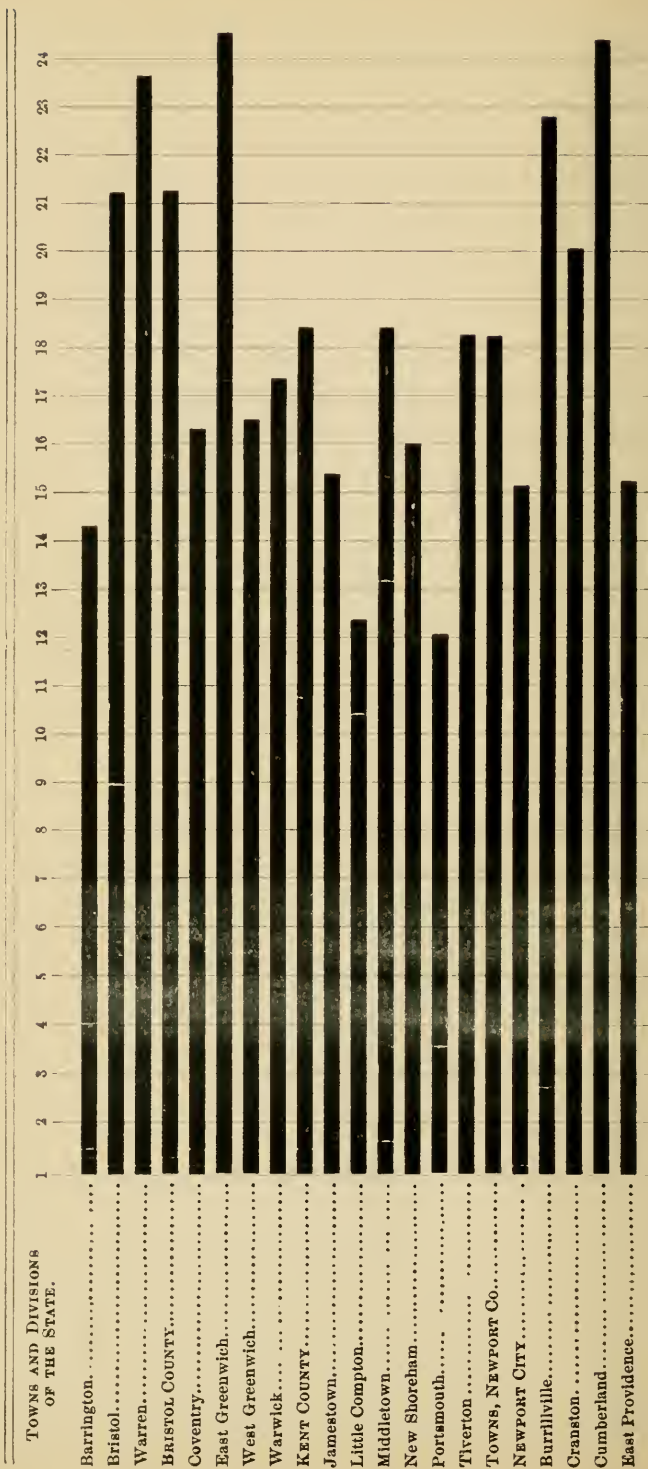
10 years, 1861-1870.....	1,131 births.....	557 marriages.....	1,153 deaths.
10 years, 1871-1880.....	1,615 births..	705 marriages.....	1,573 deaths.
1881.....	192 births.....	84 marriages.....	186 deaths.
1882.....	179 births.....	74 marriages.....	145 deaths.
1883.....	197 births.....	52 marriages.....	166 deaths.
1884.....	185 births.....	70 marriages.....	187 deaths.
1885.....	199 births.....	69 marriages.....	183 deaths.
1886.....	212 births.....	85 marriages.....	198 deaths.
1887.....	211 births.....	97 marriages.....	203 deaths.
1888.....	202 births.....	69 marriages.....	200 deaths.
<hr/>			
Last 8 years.....	1,577 births.....	600 marriages.....	1,468 deaths.
Total, 28 years.....	4,323 births.....	1,862 marriages.....	4,194 deaths.
Excess of births over deaths during the twenty-eight years.....			129

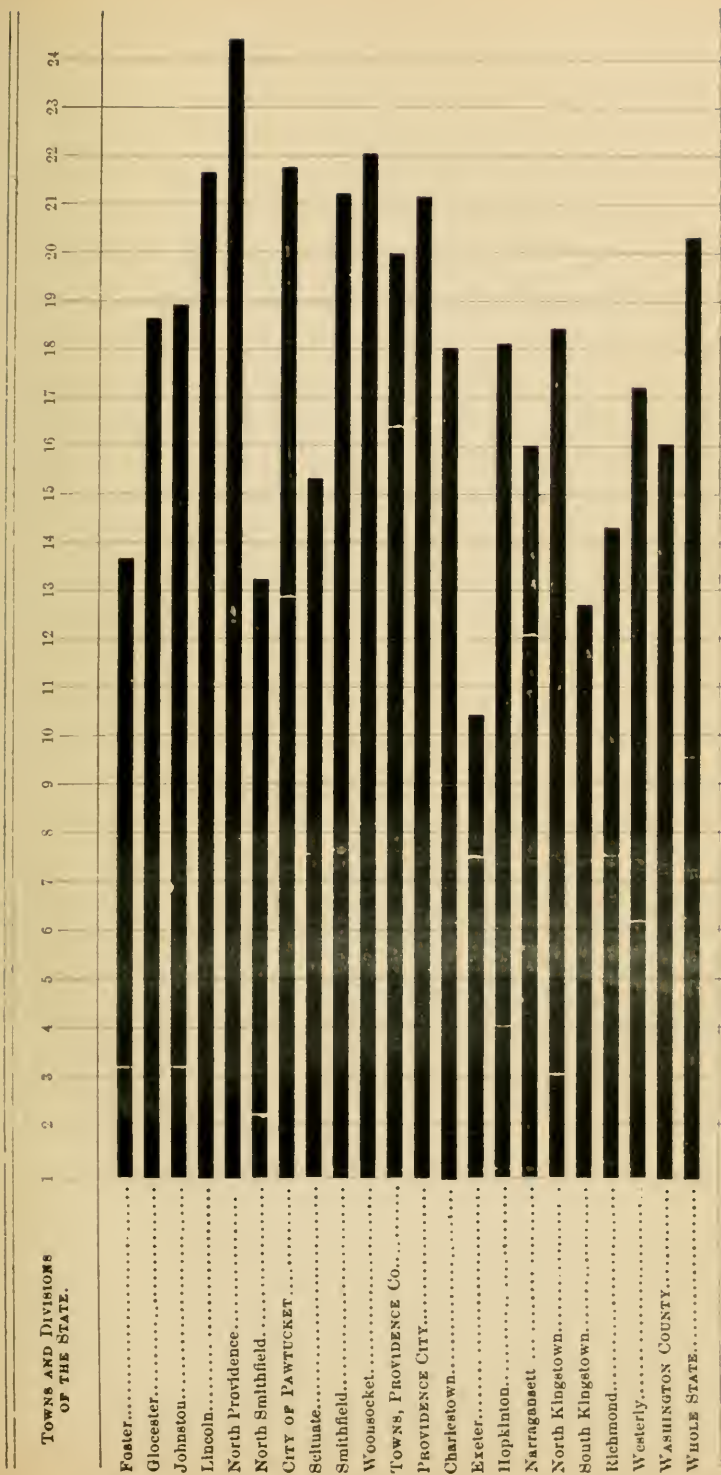
During the first ten years (1861-1870) there were twenty-two more deaths than births; during the second ten (1871-1880) forty-two more births than deaths; During the last eight years (1881-1888) one hundred and nine more births than deaths. For the whole twenty-eight years there was an average excess of less than five births a year. For the last eight years the excess of births over the deaths have averaged nearly fourteen per year. During the last year, however, it will be noticed that the number of births was only two more than the deaths.

DEATH RATES.

Diagram II.—Showing the number of deaths in every 1000 of the population, in each town and each county in the State during the year 1888, computed upon the population as estimated by the town authorities.

For explanation see foot note on next page.





The figures at the top of the perpendicular lines indicate, in whole numbers, the number of deaths during the year in every 1000 persons. The spaces are fractional parts of one. For instance, the heavy horizontal line against Barrington, at the top of this diagram, reaches across about three-tenths of the space between the perpendicular lines 14 and 15. It shows the death rate of Barrington, in 1888, was about fourteen and three-tenths in every 1000 of the population, according to estimation.

CAUSES OF DEATH, 1888.

The statistics of the causes of death in Rhode Island, in 1888, may be found in Tables VII, VIII, IX and XI. The whole number of deaths, as previously stated, was 6,594. The number of which the cause of death was reported was 6,566, and the number of which the cause was not stated was 28.

The following Table shows the number of deaths in 1888, in each large division of the State, and the number and proportion in each division from which causes were reported unknown :

TABLE LVI.

1888.	Bristol County.	Kent County.	Newport County, Towns.	Providence County, Towns.	Washington County.	Newport City.	Pawtucket.	Providence City.	Woonsocket.	Whole State.
Number of Deaths.....	251	408	139	1,466	368	319	557	2,614	442	6,594
Cause not stated,... ..	.....	.....	1	8	1	2	6	9	1	28
One in.....	.....	.....	139	183.2	368	159.5	93	293.7	442	235.5

TABLE LVII.

Proportion of Deaths reported with "Cause Unknown" in each Division of the State, and in the whole State, for a period of thirty-four years, from 1855 to 1888, inclusive, arranged in six periods of five years each, and in each of the last four years.

YEARS.	STATE DIVISIONS.							In every 1000 Deaths.
	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.	Whole State.	
1855-1859, One in every.....	19.8	7.6	15.4	5.8	34.3	5.3	9.0	111.1
1860-1864, One in every.....	25.7	10.6	17.8	8.4	35.3	25.1	14.7	68.0
1865-1869, One in every.....	60.2	12.6	28.7	7.1	58.8	21.3	14.0	71.4
1870, One in every.....	.....	19.3	23.6	11.8	90.2	26.9	23.6	42.4
1871, One in every.....	151.0	81.2	7.9	8.4	83.6	9.8	13.0	76.9
1872, One in every.....	13.3	5.8	10.0	6.8	72.8	9.8	11.3	88.5
1873, One in every.....	.....	16.0	25.4	9.8	102.5	27.5	20.3	49.3
1874, One in every.....	54.0	15.2	14.0	17.2	73.7	21.2	27.8	45.9
1870-1874, One in every.....	43.7	27.5	16.2	10.8	84.6	19.0	19.2	52.1
1875, One in every.....	55.0	7.4	15.6	13.7	91.2	11.9	20.9	47.8
1876, One in every.....	11.5	7.9	18.5	9.9	124.3	22.8	19.3	45.8
1877, One in every.....	.....	17.7	9.7	11.9	323.0	16.0	23.2	43.1
1878, One in every.....	32.1	7.4	9.0	13.7	124.2	21.7	21.1	47.4
1879, One in every.....	16.6	9.2	12.4	9.5	225.1	8.6	17.6	56.8
1875-1879, One in every.....	23.0	9.9	13.0	11.7	177.6	16.2	20.4	49.0
1880, One in every.....	21.9	23.5	13.5	10.5	122.3	17.8	20.7	48.3
1881, One in every.....	204.0	13.0	11.2	7.3	143.0	6.5	14.4	69.4
1882, One in every.....	37.6	11.6	10.9	10.6	187.0	7.7	18.8	53.2
1883, One in every.....	40.4	15.9	15.0	15.3	392.8	17.0	28.4	36.2
1884, One in every.....	100.0	40.0	81.6	91.7	372.1	94.0	122.4	8.2
1880-1884, One in every.....	80.8	20.8	26.4	27.1	243.4	28.6	40.9	24.5
1885, One in every.....	.....	.....	137.0	45.6	309.1	52.2	91.3	10.9
1886, One in every.....	110.5	192.5	86.0	87.0	195.1	55.2	113.7	7.9
1887, One in every.....	.....	.....	73.5	782.6	264.0	.....	333.7	3.0
1888, One in every.....	.....	.....	152.7	164.3	293.8	368.0	235.7	4.3

* Not including Providence City.

The average annual proportion of deaths in the whole State, reported with cause unknown during the first ten of the above thirty-four years, that is, from 1855 to 1864, inclusive, was one in every 11.8 ; or 89.5 in every one thousand decedents.

The average annual proportion of the same for the last four years was one in every 193.5, or less than 5.2 in every one thousand decedents, showing great improvement in the complete filling out of the returns.

TABLE LVIII.

Exhibiting the Order in regard to Number and Proportion of Decedents from Thirteen Principal Causes of Death.

1888.	1887.	1886.	1885.	1884.	1883.	June 1st, 1883, to Dec. 31st, 1882—30 yrs. 7 mos. 7 months.	Per 1000 of whole No of deaths, 30 years, 7 months.
Whole Number.....6,594	Whole Number.....6,340	Whole Number.....5,849	Whole Number.....5,389	Whole Number.....5,141	Whole Number.....5,982	Whole Number...101,230	
Consumption.....800	Consumption.....710	Consumption.....826	Consumption .....781	Consumption .....739	Consumption.....766	Consumption.....16,025	158.3
Pneumonia.....508	Pneumonia.....488	Pneumonia.....481	Pneumonia.....467	Pneumonia.....363	Pneumonia .....400	Pneumonia .....6,099	60.2
Cholera Infantum...407	Brain, Diseases of...440	Cholera Infantum...377	Heart, Diseases of...349	Cholera Infantum...325	Heart, Diseases of...325	Old Age.....5,408	53.4
Heart, Diseases of...436	Heart, Diseases of...406	Apoplexy and Paralysis .....333	Apoplexy and Paralysis .....289	Apoplexy and Paralysis .....298	Apoplexy and Paralysis .....275	Cholera Infantum...5,142	50.8
Apoplexy and Paralysis.....367	Cholera Infantum...355	Heart, Diseases of...330	Cholera Infantum...279	Old Age.....293	Old Age.....275	Scarlatina.....4,398	43.4
Old Age.....290	Apoplexy and Paralysis .....328	Old Age.....276	Old Age.....267	Heart, Diseases of...285	Fever, Typhoid, &c.....258	Dysentery and Diarrhoea .. 4,310	41.5
Brain, Diseases of...284	Diphtheria .....287	Diphtheria .....238	Brain, Diseases of...189	Diarrhoea and Dysentery.....194	Cholera Infantum...242	Heart, Diseases of...3,947	39.0
Fever, Typhoid .....235	Old Age.....278	Accidents.....189	Cancers.....193	Accidents.....180	Diarrhoea and Dysentery.....184	Fever, Typhoid, &c.....3,755	37.1
Bronchitis.....228	Scarlatina .....266	Brain, Diseases of...182	Accidents.....173	Fever, Typhoid, &c.....165	Brain, Diseases of...179	Apoplexy and Paralysis.....3,527	34.8
Kidney, Diseases of 243	Accidents.....206	Bronchitis.....206	Fever, Typhoid, Dysentery.....174	Cancers.....158	Accidents (all kinds).....169	Scarlatina.....3,018	30.8
Scarlatina .....207	Bronchitis.....176	Fever, Typhoid, Dysentery.....169	Diarrhoea and Dysentery.....130	Brain, Diseases of...148	Accidents.....155	Diphtheria*.....2,949	*39.1
Cancer.....193	Kidney, Diseases of 169	Cancers.....162	Diphtheria.....99	Convulsions ... 139	Convulsions .....126	Convulsions and Fits.....2,203	21.7
Diphtheria .....191	Cancers....	159	Kidneys, Disease of 155	Scarlet Fever.....91	Diphtheria .....95	Croup.....2,013	19.8

* 25 years, 1888 to 1882, inclusive.

Consumption partially recovered, during 1888, the loss in the number of its decedents in 1887 (710) compared with that of 1886 (826), the decedents in 1888 numbering 800. The proportion of deaths from consumption to whole number of deaths from all causes, and to the population, has steadily declined, with some yearly fluctuations, during the last thirty years.

Pneumonia caused a larger number of deaths than in any previous year, but not much larger than the proportional increase of the population, perhaps two per cent. more.

Cholera infantum had a rather larger prevalence than in the previous year, and in a few towns was quite fatal, but was not epidemic in any locality.

Diseases of the heart have been steadily on the increase for a number of years, causing the largest number of deaths, during 1888, ever before recorded from those diseases.

Typhoid fever, bronchitis, diseases of the kidneys, and cancer, were each the cause of a considerably increased number of deaths over the previous year, while diphtheria and scarlatina had a considerably lessened mortality.

TABLE LIX.

A summary of Deaths in Rhode Island in 1888, from twenty-two leading causes, showing the Number, Sex, Parentage, Season, Ages and Localities.

	Accidents.	Apoplexy and Paralysis.	Bowel Diseases.	Brain Diseases.	Bronchitis.	Cancer.	Cholera Infantum.	Consumption.	Croup.	Diarrhea.	Diphtheria.	Dysentery.	Fevers, Malarial.	Fevers, Typhoid, etc.	Heart Diseases.	Kidney Diseases.	Liver Diseases.	Old Age.	Peritonitis.	Pneumonia and Conges- tion of Lungs.	Scarlatina.	Whooping Cough.
Number of deaths from each cause..	190	367	148	284	228	193	467	800	79	80	191	77	71	235	436	213	68	290	60	508	207	44
MALES.	155	164	70	152	105	67	239	391	43	40	87	29	33	125	196	102	38	108	23	274	101	17
FEMALES.	45	203	78	132	123	126	228	409	36	40	104	48	38	110	240	111	30	182	37	234	106	27
AMERICAN.	63	234	52	143	79	128	184	284	34	44	79	38	24	88	240	122	36	198	24	227	91	16
FOREIGN.	127	133	96	141	149	65	283	516	45	36	112	39	47	147	196	91	32	92	36	281	116	28
JANUARY.	14	32	9	29	32	18	7	72	15	3	24	...	4	10	51	12	6	25	3	67	47	4
FEBRUARY.	8	26	10	26	24	13	5	70	13	4	9	1	3	5	33	20	6	25	5	72	40	5
MARCH.	9	33	6	24	34	11	2	81	7	4	22	3	2	8	34	23	5	24	3	98	26	4
APRIL.	13	42	4	29	21	12	1	67	8	1	17	...	5	8	36	14	7	26	4	76	22	1
MAY.	28	33	7	19	20	14	2	70	3	2	14	1	8	11	37	15	5	34	5	38	17	2
JUNE.	15	34	9	21	15	16	14	65	4	3	13	1	8	6	38	15	4	17	6	20	14	1
JULY.	16	33	21	23	17	19	158	55	3	17	18	18	9	8	33	12	8	20	1	14	11	2
AUGUST.	13	31	26	18	7	22	169	63	3	25	7	26	6	33	35	21	7	36	12	12	6	7
SEPTEMBER.	16	14	16	17	14	18	75	68	5	10	14	15	12	32	42	16	5	21	5	11	3	4
OCTOBER.	20	43	10	27	13	19	23	69	7	7	15	7	9	20	31	18	8	21	4	33	11	5
NOVEMBER.	14	26	10	25	11	15	6	56	7	2	16	4	2	42	29	22	1	19	4	32	9	4
DECEMBER.	24	20	10	26	20	14	5	64	4	2	22	1	3	52	37	25	6	22	5	35	1	5

PAR. AGE. SEX.

SEASON.

TABLE LIX.—CONTINUED.
A summary of Deaths in Rhode Island in 1888, from twenty-two leading causes, showing the Number, Sex, Parentage, Season, Ages and Localities.

	Accidents.	Apoplexy and Paralysis.	Bowel Diseases.	Brain Diseases.	Bronchitis.	Cancer.	Cholera Infantum.	Consumption.	Croup.	Diarrhoea.	Diphtheria.	Dysentery.	Fever, Malarial.	Fever, Typhoid, etc.	Heart Diseases.	Kidney Diseases.	Liver Diseases.	Old Age.	Pleuritis.	Pneumonia and Conges- tion of Lungs.	Scarlatina.	Whooping Cough.
Under 5 years.....	28	9	29	157	115	3	467	29	67	54	110	2	14	15	17	12	10	...	5	103	129	44
5 and under 10.....	20	2	8	28	5	...	...	8	12	...	57	4	3	12	9	5	1	...	2	20	57	...
10 ".....	6	2	6	14	2	...	...	18	...	...	12	...	5	27	7	5	...	...	4	5	13	...
15 ".....	12	...	2	7	2	1	...	86	...	...	5	1	3	42	6	4	...	...	6	15	3	...
20 ".....	26	4	13	11	9	2	...	244	...	...	3	1	3	6	25	12	3	...	17	49	3	...
30 ".....	11	18	14	10	9	17	...	173	...	...	2	1	2	10	29	30	5	...	8	48	1	...
40 ".....	39	29	14	15	8	29	...	99	...	1	4	5	9	16	54	43	13	...	5	61	1	...
50 ".....	17	61	22	9	16	49	...	59	...	...	...	4	9	12	84	34	12	...	3	62	...	...
60 ".....	11	85	22	15	28	48	...	45	...	2	...	9	9	3	97	42	10	...	7	50	...	...
70 ".....	11	100	12	9	20	30	...	26	...	12	1	16	4	3	74	27	10	...	86	1	...	...
80 and over.....	8	60	9	8	14	13	...	12	...	6	...	9	1	...	31	7	2	197	...	21	...	...
Not stated.....	1	...	...	...	...	1	...	...	...	...	...	...	...	...	2	...	1	...	...	...	...	...
Bristol County.....	4	29	4	...	3	9	18	28	4	5	13	1	1	20	11	10	1	16	6	16	1	...
Kent County.....	6	26	4	25	4	10	35	55	2	3	3	5	2	24	22	10	5	26	4	37	29	3
Newport County.....	8	13	4	3	3	6	4	6	...	...	...	2	...	7	14	7	2	14	...	8	6	...
Newport City.....	6	16	6	14	14	6	24	26	7	...	...	...	3	7	26	17	4	...	...	...	...	...
Providence County Towns.....	47	74	39	59	67	37	119	150	24	25	36	9	28	45	83	30	16	77	12	99	40	9
Pawtucket.....	9	19	17	26	32	14	40	57	7	11	14	6	17	10	30	12	11	31	4	49	5	2
Providence City.....	88	137	56	118	88	88	149	362	27	33	98	38	19	102	210	115	26	64	23	219	80	27
Woonsocket.....	14	20	9	15	11	6	60	66	3	3	8	3	3	11	9	4	1	16	3	23	42	...
Washington County.....	8	33	9	16	6	17	18	50	5	3	10	12	..	9	31	8	2	35	3	36	...	...

COMMENTS.

In the preceding pages there have been presented, numerically and in tabular form, the various causes of death in Rhode Island, in 1888. In Tables VII and VIII they were presented at considerable length, in various specific terms, and in Table IX more or less grouped in a general nosological arrangement.

In Table VII the number of deaths from *each cause* and of *each sex* is shown, for *each month* in the year, and the *parentage* of the decedents from *each cause* during the year.

In Table VIII the number of decedents of *each sex* from *each cause*, in the *different periods of life* is given.

In Table IX, with the classification and percentage of causes of death, the number of each general cause, in each division of larger population, is given.

Table LIX is a compend in part of the three tables previously alluded to, and contains the particulars of the causes of death, in 1888, of the principal causes which will be commented upon in the following pages.

DEATHS FROM ACCIDENTS.

The number of deaths from accidental causes of all kinds, reported in Rhode Island, in 1888, was 190. This number is 16 less than during 1887.

Among the 190 deaths from accident there were 8 from asphyxia; 27 from burns and scalds; 46 from drowning; 18 from falls; 8 from fractures of various kinds; 12 from poison; 25 from accidents of various forms on railroads; and 46 from numerous other accidental circumstances.

Of the whole number of deaths by accident 145 were males, and 45 were females; 63 were of American, and 127 were of foreign parentage.

Of the sexes the proportion was 76.3 per cent. of male decedents to 23.7 per cent. of female decedents. Of parentage, 66 per cent. was of foreign, and 34 per cent. of American.

The number of deaths in each division of the year was as follows :

First Quarter.....	31	Third Quarter.....	45
Second Quarter	56	Fourth Quarter.....	58
—		—	
First half.....	87	Second half....	103
Whole Year		190	

In regard to periods of life, the decedents from accidental causes were divided as follows: Under 5 years, 28; 5 and under 10, 20; between 10 and 20, 18; between 20 and 40, 37; between 40 and 60, 56; over 60, 30; and 1, age not stated.

In regard to sectional divisions of the State, 4 of the deaths from accidental causes were in Bristol county; 6 in Kent county; 14 in Newport county; 8 in Washington county, and 158 in Providence county.

The whole number of deaths from accidental causes, in 1888, *in proportion to the whole number of deaths* from specified causes, in the State, was about 28.7 in every one thousand.

In the following Table may be found the number, sex, parentage and locality of mortality from accidents, for twenty-four years, ending December 31, 1888.

TABLE LX.

Mortality in the State from Accidents, with the Percentage of the Whole Number of Deaths; Sex, Parentage and Locality, for twenty-four years, from 1865 to 1888, inclusive, in two periods of five years each, and for the last fourteen years.

YEARS.	Whole Number.	VARIETIES.								Per cent.	SEX.		PARENT-AGE.		STATE DIVISIONS.					
		Burns and Scalds.	Drowning.	Falls.	Fractures and Contusions.	Poisoning.	Railroad.	Suffocation.	Various and Unspecified.		Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
5 years, 1865-1869	515	81	114	70	..	14	32	1	203	3.31	397	118	245	270	26	36	52	192	166	43
5 years, 1870-1874	612	73	159	89	..	17	68	10	196	3.16	493	119	284	328	22	45	49	219	233	44
1875....	142	17	35	20	..	6	12	5	47	3.15	107	35	65	77	7	7	8	37	62	21
1876.....	132	12	37	12	..	4	10	9	48	3.20	98	34	48	84	1	10	11	37	62	11
1877.....	137	18	30	14	..	9	13	5	48	3.08	104	33	66	71	6	12	10	41	61	7
1878.....	135	11	44	13	..	6	7	...	54	3.19	97	38	56	79	4	7	9	51	59	5
1879.....	112	13	22	16	..	6	10	...	45	2.50	81	31	48	64	2	9	12	26	59	4
1875-1879	658	71	168	75	..	31	52	19	242	3.02	487	171	283	375	20	45	50	192	303	48
1880.....	146	21	33	14	..	5	18	...	55	3.02	108	38	57	89	5	17	10	39	71	4
1881.....	155	16	29	19	..	9	20	19	43	3.09	107	48	62	93	5	17	12	60	56	5
1882.....	178	17	40	31	..	6	16	8	60	3.50	130	48	72	106	5	9	15	60	80	9
1883.....	153	18	27	21	..	6	16	12	53	2.84	117	36	61	92	4	8	9	63	66	3
1884.....	197	20	41	31	..	7	16	11	71	3.82	147	50	90	107	5	19	14	65	76	18
1880-1884.....	829	92	170	116	..	33	86	50	282	3.26	609	220	342	487	24	70	60	257	349	39
1885.....	173	19	42	25	..	9	15	9	54	3.20	135	38	72	101	5	6	8	58	83	13
1886.....	190	23	58	19	..	6	20	9	55	3.25	141	49	84	106	16	11	16	62	72	13
1887.....	206	17	39	17	23	7	24	14	65	3.24	158	48	92	114	5	11	23	81	71	15
1888.....	190	27	46	18	8	12	25	8	46	2.87	145	45	63	127	4	6	14	70	88	8
Total.....	3373	403	796	429	31	129	322	130	1143	3.17	2565	808	1465	1908	122	230	272	1161	1365	223

* Exclusive of Providence City.

TABLE LXI.

Mortality in the State from Alcoholism, with the Percentage of the Whole Number of Deaths, Sex, Parentage and Locality, for twenty-four years, from 1865 to 1888, inclusive.

YEARS.	Number of Deaths from Alcoholism.	Per cent.	SEX.		PARENTAGE		STATE DIVISIONS.					
			Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
5 years, 1865-1869.	55	.38	48	7	27	28	1	4	5	12	29	4
5 years, 1870-1874.	93	.51	74	19	40	53	4	7	9	33	37	3
5 years, 1875-1879.	81	.39	56	25	27	54	2	4	7	17	48	3
1880.....	15	.32	9	6	5	10	1	.....	1	4	8	1
1881.....	24	.51	17	7	5	19	1	.....	1	7	14	1
1882.....	28	.58	16	12	8	20	.....	.....	.....	9	18	1
1883.....	29	.54	17	12	7	22	.....	1	1	10	16	1
1884.....	27	.53	19	8	10	17	.....	1	4	9	12	1
1880-1884.....	123	.50	78	45	35	88	2	2	7	39	68	5
1885.....	22	.41	16	6	6	16	2	1	.....	11	7	1
1886.....	12	.20	9	3	2	10	1	.....	1	3	7	.....
1887.....	16	.25	14	2	4	12	2	2	2	5	4	1
1888.....	16	.32	10	6	5	11	.....	.....	2	5	9	.....
Total.....	418	.39	305	113	146	272	14	20	34	125	309	17

APOPLEXY AND PARALYSIS.

There were 367 deaths from apoplexy and paralysis in Rhode Island, in 1888, according to the returns. The number reported is 39 more than in the year 1887.

The following Table will present the sex, parental and local relations of apoplexy and paralysis, as causes of death, during the last twenty-four years :

* Pawtucket and Woonsocket included.

TABLE LXII.

Presenting the Whole Number and Percentage of the Deaths in the State, from Apoplexy and Paralysis combined; and also the Sex and Parentage of the Decedents from these causes, and the Number of the same in each of the Counties, from 1865 to 1888, inclusive.

YEARS	Whole Number of Deaths.	APOPLEXY AND PARALYSIS.											
		Number from Apo- plexy and Paralysis.	Per cent.	SEX.		PARENTAGE		DIVISIONS OF THE STATE.					
				Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
1865...	3,405	100	2.93	52	48	81	19	9	8	14	23	38	8
1866...	2,970	92	3.09	46	46	80	12	7	5	17	24	29	9
1867...	2,889	124	4.29	59	65	101	23	9	9	13	35	49	9
1868...	2,912	111	3.81	56	55	86	25	9	6	19	27	46	4
1869...	3,382	117	3.46	55	62	92	25	12	13	18	20	48	6
1870...	3,238	130	4.32	68	62	105	25	14	10	10	39	52	5
1871...	3,344	156	4.66	73	83	113	43	10	17	15	40	61	13
1872...	4,247	125	2.97	62	63	96	29	17	9	10	27	52	10
1873...	4,403	134	3.04	59	75	109	25	9	8	17	26	57	17
1874...	4,229	156	3.69	84	72	120	36	14	10	16	42	59	15
1875...	4,317	166	3.61	79	87	133	33	7	13	17	46	75	8
1876...	4,116	165	4.01	79	86	130	35	13	11	13	45	68	1
1877...	4,450	181	4.07	87	94	123	58	10	10	16	52	74	19
1878...	4,441	188	4.23	104	84	145	43	12	16	21	58	66	15
1879...	4,472	220	4.92	114	106	146	74	12	9	29	71	89	10
1880...	4,829	215	4.67	109	106	157	58	18	13	22	71	78	13
1881...	5,016	244	4.86	116	128	170	74	17	15	25	70	101	16
1882...	5,074	265	5.22	139	126	168	97	15	29	25	65	117	15
1883...	5,282	275	5.22	138	137	192	83	11	28	22	75	118	21
1884...	5,141	298	5.80	135	163	176	122	21	14	28	108	105	22
1885...	5,389	289	5.38	144	145	183	106	16	18	28	99	110	18
1886...	5,849	333	5.70	173	160	230	103	11	27	32	108	120	35
1887...	6,340	328	5.17	161	167	213	115	21	27	23	101	128	28
1888...	6,594	367	5.41	164	203	234	133	29	26	29	113	137	33
Total...	106,324	4,779	4.49	2,338	2,441	3,383	1,396	324	351	478	1,385	1,877	364

* Not including Providence city.

Table LXII shows a large proportional as well as actual increase of deaths from apoplexy and paralysis, during the twenty-four years.

The proportions, however, have not varied much during the last six years.

TABLE LXIII.

Ages of Decedents from Apoplexy and Paralysis, in each of the last twenty-four years.

APOPLEXY AND PARALYSIS.	PERIODS OF LIFE.							
	Under 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 and over. Not stated.
1865		3	5	6	19	20	28	19
1866	1	1	7	16	9	24	27	7
1867	2		6	6	15	38	40	17
1868	2	3	3	11	16	27	31	16 2
1869	1	1	5	12	20	28	31	15 1
1870	4	1	10	9	12	33	41	20
1871	3	4	7	14	21	46	45	15 1
1872	1	4	5	17	20	26	41	11
1873	2	3	4	14	22	35	37	16 1
1874	1	2	9	9	30	39	40	25 1
1875	6	2	8	19	23	40	45	22 1
1876	4	4	4	13	25	43	49	23
1877	1	2	9	12	21	50	61	22
1878	4	2	7	14	41	40	53	26 1
1879	4	6	11	18	27	57	59	38 1
1880	1	2	8	18	21	59	70	34 2
1881	1	7	11	20	36	55	70	42 2
1882	4	5	14	28	41	57	77	38 1
1883	8	4	11	19	45	56	83	49
1884	10	7	16	21	32	68	95	45 4
1885	8	5	7	25	29	76	94	44 1
1886	7	8	10	25	52	65	112	51 3
1887	12	6	13	26	50	90	96	9 1
1888	10	4	18	29	61	85	100	8 1
Total	97	76	208	401	691	1,157	1,417	612 24

BRAIN DISEASES.

The number of decedents from diseases of the brain proper, for 1888, was 212.

Of the 212 decedents 114 were males, and 98 were females. In regard to parentage, 109 were of American, and 103 of foreign parentage.

The deaths in the different seasons of the year were as follows:

First Quarter.....	79	Third Quarter.....	58
Second Quarter.....	69	Fourth Quarter.....	78
<hr/>			
First half.....	148	Last half.....	136
Whole number.....		284	

It is not in accordance with the rule that the largest number of deaths from diseases of the brain should occur in the first quarter of the year.

Brain diseases occur largely in children. Of the 212 decedents from those causes, in 1888, 53 were under five years of age, and 22 were from five to ten years of age.

The following Table will present the statistics of mortality from diseases of the brain, for twenty-four years:

TABLE LXIV.

Mortality in the State from Brain Diseases, with the Percentage of the Whole Number of Deaths, Sex, Parentage and Locality, for twenty-four years, from 1865 to 1888, inclusive.

YEARS.	Number of Deaths from Brain Diseases.	Per cent.	SEX.		PARENTAGE		STATE DIVISIONS.					
			Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
1865-1869	444	2.85	213	201	281	163	17	23	37	128	209	30
1870	95	2.93	49	46	46	49	4	5	10	31	42	3
1871	92	2.75	49	43	60	32	3	8	6	25	43	7
1872	134	3.16	71	63	79	55	2	7	12	41	69	3
1873	136	3.09	74	62	76	68	1	7	10	31	86	1
1874	127	3.00	74	53	74	53	3	4	6	40	74	.....
1870-1874	584	2.99	317	267	335	249	13	31	44	168	314	14
1875	118	2.73	63	55	69	49	3	6	5	30	65	9
1876	150	3.64	92	58	89	61	3	11	7	39	85	5
1877	160	3.59	88	72	91	69	3	7	11	49	85	5
1878	142	3.19	75	67	76	66	1	13	12	45	68	3
1879	163	3.65	82	81	88	75	3	13	15	51	75	6
1875-1879	733	3.36	400	333	413	320	13	50	50	214	378	28
1880	164	3.39	87	77	89	75	3	6	12	56	81	6
1881	186	3.69	103	83	85	101	7	11	14	58	91	5
1882	181	3.50	93	88	92	89	4	10	10	71	80	6
1883	187	3.54	96	91	100	87	8	14	15	52	94	4
1884	118	2.88	90	58	77	71	4	9	8	41	83	3
1880-1884	866	3.40	469	397	443	423	26	50	59	278	429	24
1885	189	3.51	98	91	94	95	2	11	20	53	100	3
1886	182	3.09	108	74	84	98	4	14	13	69	78	4
1887	203	3.21	120	83	103	100	8	9	14	75	95	2
1888	212	3.21	114	98	109	103	4	19	12	76	90	11
Total	3,413	3.68	1,869	1,544	1,862	1,551	87	207	249	1,061	1,693	116

* Providence city not included.

N. B. Cerebro spinal meningitis, hydrocephalus, tubercular meningitis and insanity not included in the above Table.

BRONCHITIS.

The number of decedents, in 1888, whose deaths were reported as having been caused by bronchitis, was 228. This is a considerably larger number than was ever before returned in a single year.

Of the 228 decedents 105 were males, and 123 were females; or at the rate of 82 males to each 100 females.

In relation to parentage, 79 were of American, and 149 of foreign parentage.

In regard to age, 115 of the decedents were under 5 years of age, 9 were between 5 and 20 years, 18 between 20 and 40 years, 24 between 40 and 60 years, and of the remaining 62 decedents above 60 years of age, there were 15 deaths from chronic bronchitis.

The following Table will show various facts in relation to the mortality from bronchitis, for twenty-four years :

TABLE LXV.

Mortality in the State from Bronchitis, twenty-four years, from 1865 to 1888, inclusive.

YEARS.	BRONCHITIS.											
	Number of Deaths.	Per cent.	SEX.		PARENTAGE		DIVISIONS OF THE STATE.					
			Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
1865	9	.27	4	5	6	3	1	.....	3	.....	5	.....
1866	14	.51	3	11	10	4	.....	1	2	7	4	.....
1867	19	.71	8	11	10	9	1	2	1	5	10	.....
1868	20	.76	9	11	7	13	.....	1	2	5	10	2
1869	20	.65	8	12	9	11	.....	.....	1	4	15	.....
1870	26	.84	15	11	11	15	.....	.....	8	8	17	.....
1871	24	.78	10	14	11	13	.....	1	1	5	17	.....
1872	25	.65	10	15	11	14	1	1	1	6	16	.....
1873	27	.64	12	15	11	16	.....	.....	1	7	18	1
1874	39	.96	22	17	12	27	.....	.....	.....	6	32	1
1875	57	1.39	32	25	29	28	.....	.....	1	21	33	2
1876	57	1.46	23	34	26	31	.. ..	2	.....	7	46	2
1877	69	1.62	32	37	35	34	1	1	1	22	44	.....
1878	80	1.89	30	50	37	43	1	2	6	22	48	1
1879	62	1.47	31	31	31	31	1	1	5	21	34	.....
1880	91	1.98	49	42	44	47	1	6	6	21	56	1
1881	84	1.80	48	36	39	45	1	1	2	25	53	2
1882	100	2.08	39	61	47	53	3	2	6	25	60	4
1883	111	2.10	56	55	51	60	5	2	3	41	57	2
1884	118	2.29	58	60	40	78	7	.....	8	42	62	.....
1885	168	3.08	82	86	91	77	5	3	13	71	76	.....
1886	174	2.96	75	99	81	93	3	4	9	74	83	1
1887	176	2.77	90	86	60	116	3	6	19	63	84	1
1888	228	3.45	105	123	79	149	3	4	17	110	88	6
Total, 24 years..	1,798	1.69	851	947	788	1,010	37	40	109	619	968	26

During the first four months of the year the decedents from bronchitis numbered 131, during the last four months the number was 58.

* Not including Providence city.

CANCER.

There were 193 decedents, in 1888, whose deaths were caused by cancer, according to the returns. The term cancer includes all the various kinds, and in whatever place located.

The varieties of cancer, as reported, may be found in Tables VII and VIII, on pages 17 and 18. They are classed in Table IX as follows: Cancer in various localities, or cancer (various), 91; cancer of the breast, 21; of the liver, 23; of the stomach, 35; of the uterus, 23.

In 1888 the deaths from cancer, in the several divisions of the year, were as follows:

First Quarter.....	44	Third Quarter.....	58
Second Quarter.....	43	Fourth Quarter.....	48
<hr/>		<hr/>	
First half.....	87	Last half.....	106
Whole number.....		193	

Sex.—Of the 193 decedents from cancer, 67 were males, and 126 were females; or 34 males and 66 females in every 100.

Parentage.—There were 128 of American parentage, and 65 of foreign.

The following Table will show the facts of mortality from cancer, in relation to sex, parentage and locality, for twenty-four years:

TABLE LXVI.

Mortality in the State from Cancer, from 1865 to 1888, inclusive.

YEARS	CANCER.											
	Number of Deaths.	Percentage.	SEX.		PARENTAGE.		STATE DIVISIONS.					
			Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
1865.	55	1.70	13	42	45	10	5	7	8	16	17	2
1866.	64	2.29	17	47	57	7	7	5	7	13.	27	5
1867.	58	2.15	14	44	45	13	5	3	10	19	18	3
1868.	60	2.29	21	39	45	15	.....	8	6	11	32	3
1869.	66	2.14	19	47	56	10	2	5	7	19	27	6
1870.	80	2.58	27	53	66	14	5	12	8	25	27	3
1871.	66	2.13	25	41	47	19	....	7	5	25	25	4
1872.	95	2.46	26	69	66	29	4	7	9	21	50	4
1873.	106	2.53	45	61	76	30	4	6	12	32	44	8
1874.	87	2.13	23	64	67	20	4	6	12	24	38	3
1875.	95	2.31	24	71	62	33	3	6	7	25	49	5
1876.	106	2.72	27	79	72	34	5	6	8	27	53	7
1877.	135	3.17	29	106	87	48	3	7	9	37	66	13
1878.	119	2.82	38	81	79	40	5	11	8	37	48	10
1879.	125	2.96	39	86	70	55	9	6	9	28	66	7
1880.	125	2.72	45	80	73	52	5	10	12	26	68	4
1881.	145	2.90	40	105	90	55	8	10	12	42	65	8
1882.	132	2.75	40	92	82	50	5	15	9	43	52	8
1883.	169	3.20	51	118	105	64	3	17	12	49	86	2
1884.	156	3.05	39	117	88	68	2	18	21	41	70	4
1885.	193	3.50	52	141	114	79	8	9	8	67	88	13
1886.	162	2.77	42	120	75	87	6	11	9	37	87	12
1887.	150	2.50	49	110	96	63	8	5	10	49	80	7
1888.	193	2.93	67	126	128	65	9	10	12	57	88	17
Total, 24 years..	2,751	2.58	812	1,939	1,791	960	115	207	230	770	1,271	153

CHILD-BIRTH.

Under the head of "Child-birth" are included puerperal fever, puerperal convulsions, and whatever causes of death that occurred as the result of child-birth.

* Providence city not included.

The number reported in 1888 was 51; 27 of which were from the immediate effects of child-birth, including metritis, hemorrhage, &c., 6 from puerperal convulsions, and 18 from puerperal fever.

Of the whole number 13 were of American, and 38 of foreign parentage.

The following Table will present the various relations in regard to mortality from child-birth, for twenty-four years, 1865-1888 :

TABLE LXVII.

Mortality in the State from Child-Birth, with the Percentage of the Whole Number of Deaths, Parentage and Locality, for twenty-four years, from 1865 to 1888, inclusive.

YEARS.	Number of Deaths from Child Birth	Per cent.	PARENTAGE.		STATE DIVISIONS.					
			American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
1865-1869.....	145	1.00	59	86	7	8	12	58	51	9
1870.....	38	1.22	19	19	.....	.....	6	11	17	4
1871.....	45	1.45	18	27	2	3	2	18	19	1
1872.....	41	1.06	18	23	2	6	2	14	11	6
1873.....	46	1.09	26	26	1	3	3	15	18	6
1874.....	60	1.12	29	31	1	3	4	19	31	2
1870-1874.....	230	1.19	104	126	6	15	17	77	96	19
1875.....	53	1.30	26	27	1	6	1	10	31	4
1876.....	48	1.24	21	27	3	.....	1	18	23	3
1877.....	46	1.09	18	28	4	3	5	17	17	.....
1878.....	43	1.01	23	20	2	4	3	9	21	4
1879.....	43	1.02	21	22	1	7	2	6	23	4
1875-1879.....	233	1.13	109	124	11	20	12	60	115	15
1880.....	51	1.11	23	28	4	4	3	10	27	3
1881.....	60	1.28	26	34	1	1	3	22	29	4
1882.....	50	1.03	18	32	.....	5	1	16	27	1
1883.....	58	1.10	26	32	1	5	9	14	27	2
1884.....	47	.91	17	30	.....	3	3	19	18	4
1880-1884.....	266	1.09	110	156	6	18	19	81	128	14
1885.....	47	.87	21	26	.....	3	4	15	24	1
1886.....	41	.70	17	24	.....	4	4	15	17	1
1887.....	53	.71	15	38	.....	5	4	18	26	.....
1888.....	51	.77	13	38	.....	3	.....	25	20	3
Total.....	1,066	1.02	448	618	30	76	72	349	477	62

* Not including Providence city.

CHOLERA INFANTUM.

The number of deaths from cholera infantum, according to the returns for 1888, was 467, an increase of 112 over 1887.

Of the 467 decedents, 239 were males, and 228 were females.

Of parentage, 184 were of American, and 283 of foreign parentage; or 153 of foreign to every 100 of American parentage.

The following Table shows the whole number of reported deaths from cholera infantum; the sex and parentage of the decedents; and the number in each of the larger divisions of the State, in each of the last twenty-four years:

TABLE LXVIII.

YEARS.	CHOLERA INFANTUM.										
	Number of Deaths.	SEX.		PARENTAGE		DIVISIONS OF THE STATE.					
		Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
1865.....	145	63	82	61	84	17	7	14	48	50	9
1866.....	110	67	43	50	60	1	7	8	39	47	8
1867.....	117	64	53	62	55	4	3	7	45	49	9
1868.....	154	85	69	66	88	13	4	12	44	70	11
1869.....	151	81	70	79	72	6	15	6	48	65	11
1870.....	213	106	107	95	118	15	15	13	69	93	8
1871.....	172	85	87	82	90	14	12	12	59	62	13
1872.....	391	195	196	167	224	16	16	21	157	151	30
1873.....	285	148	137	165	120	17	14	16	120	99	19
1874.....	265	140	125	115	150	4	12	5	84	134	26
1875.....	318	156	162	155	163	20	16	20	108	136	18
1876.....	250	131	119	105	145	5	12	29	68	124	12
1877.....	259	139	120	96	163	12	12	9	96	122	7
1878.....	168	96	72	73	95	7	14	7	64	71	5
1879.....	161	88	73	71	90	8	16	21	51	50	6
1880.....	247	123	124	109	138	13	11	10	93	100	20
1881.....	240	130	110	102	138	10	22	14	75	102	17
1882.....	325	173	152	133	192	20	11	19	132	130	13
1883.....	242	124	118	104	138	12	7	22	88	108	5
1884.....	325	177	148	139	186	10	12	26	114	144	19
1885.....	279	150	129	128	151	5	23	16	133	86	16
1886.....	377	179	198	143	234	4	29	15	194	120	35
1887.....	355	200	155	145	210	16	16	35	160	119	9
1888.....	467	239	228	184	283	18	35	28	219	149	18
Total, 24 years.....	6,016	3,139	2,877	2,629	3,387	267	342	379	2,308	2,390	314

The number of decedents from cholera infantum, during the twenty-four years from 1865 to 1888, inclusive, was 6,016.

The proportion to total mortality, for the period of twenty-four years, was 5.7 per cent. For 1888 the proportion was 7.8 per cent.

There were 109 males to every 100 females among the decedents during the twenty-four years; and 128 decedents of foreign parentage to every 100 of American, during the same period.

* Not including Providence city.

CONSUMPTION.

The decedents from consumption, during 1888, numbered 800. The number is 90 more than in the preceding year.

Sex.—Of these 800 decedents 391 were males, and 409 were females; giving 104.6 female decedents to every 100 male decedents; or 49 males and 51 females in every 100 decedents from consumption, an unusually small difference.

As a rule there are one hundred and twenty or more females to every one hundred male decedents from consumption.

Parentage.—There were 284 decedents of American parentage, and 516 of foreign; a proportion of 181 of foreign parentage to every 100 of American.

Season.—The largest number of deaths in any one month, 81, occurred in March; the next largest, 72, in January; the smallest number, 55, in July.

The number in each quarter of the year was as follows:

First Quarter.....	223	Third Quarter.....	186
Second Quarter.....	202	Fourth Quarter.....	189
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First half.....	425	Last half.....	375
<hr/>			
Whole Number.....			
800			

Ages.—During 1888, of the 800 decedents from consumption, 244 or nearly one-third, were between the ages of 20 and 30; and 173, or more than one-fifth, were between the ages of 30 and 40.

In order to show more concisely the relation of age to mortality from consumption, during 1888, the following synopsis is presented:

Under 10 years of age.....	37
Between 10 and 20 years.....	104
Between 20 and 30 years.....	244
Between 30 and 40 years.....	173
Between 40 and 50 years.....	99
Between 50 and 70 years.....	104
Over 70 years.....	38
Not stated.....	1
<hr/>	
Total.....	800

The following Table shows the total deaths from all reported *known causes*, with the *number* and *percentage* of deaths from consumption of the same, in each of the larger divisions of the State, and in the whole State, in *each of the last seventeen years*; and also the aggregate for a period of twenty-five years, from 1860 to 1884, inclusive:

TABLE LXIX.—CONSUMPTION.—Number, Locality and Percentage.

COUNTIES.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	Total, 25 years, 1860-1884.
BRISTOL COUNTY.																		
Total deaths, stated causes	184	173	159	162	148	201	187	141	209	203	183	197	199	185	221	217	251	4,135
Consumption.....	23	16	18	21	19	27	23	16	19	25	36	19	21	12	23	20	28	543
Percentage.....	12.50	8.24	11.32	12.97	12.83	13.43	12.30	11.35	9.09	12.31	19.68	9.64	10.50	6.48	10.35	9.22	11.15	13.13
KENT COUNTY.																		
Total deaths, stated causes	248	241	252	263	209	251	249	277	293	313	288	283	268	355	385	343	408	6,206
Consumption.....	33	42	32	43	28	42	41	38	45	36	51	39	37	45	43	34	55	1,078
Percentage.....	13.30	17.43	12.69	16.35	13.39	16.73	16.47	13.72	15.35	11.20	17.71	13.78	13.43	12.70	11.20	9.91	13.44	17.37
NEWPORT COUNTY.																		
Total deaths, stated causes	262	306	221	277	280	243	265	330	324	346	378	401	403	408	433	435	458	7,869
Consumption.....	29	44	26	41	45	33	31	45	34	51	46	55	43	47	57	41	32	1,086
Percentage.....	11.06	12.02	11.77	14.80	16.07	13.58	11.69	13.64	10.40	14.74	12.17	13.72	10.67	11.52	13.16	9.19	7.00	13.80
PROVIDENCE COUNTY.*																		
Total deaths, stated causes	1,331	1,389	1,217	1,230	1,110	1,301	1,308	1,233	1,437	1,451	1,509	1,656	1,723	1,918	2,087	2,345	2,465	28,161
Consumption.....	321	197	136	201	211	222	229	197	189	220	224	257	248	273	276	246	273	4,799
Percentage.....	16.73	14.18	11.41	16.34	19.01	15.96	17.51	15.98	15.35	15.16	14.82	15.52	14.13	14.20	13.05	10.49	11.07	17.04

* Not including Providence city.

TABLE LXIX.—CONSUMPTION.—Number, Locality and Percentage.—Continued.

	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	Total, 25 years, 1860-1884.
COUNTIES.																		
PROVIDENCE CITY.																		
Total deaths, stated causes	1,581	1,725	1,965	1,894	1,850	1,932	1,973	2,017	2,063	2,130	2,230	2,351	2,227	2,157	2,341	2,650	2,644	39,195
Consumption.....	242	230	270	297	284	294	305	293	322	344	351	364	344	348	368	323	362	6,374
Percentage.....	15.31	13.33	13.74	15.68	15.35	15.22	15.46	14.53	15.60	16.15	15.73	15.48	15.43	16.10	15.65	12.23	13.66	16.26
WASHINGTON COUNTY.																		
Total deaths, stated causes	265	292	263	284	306	240	249	220	270	226	215	208	279	307	331	351	368	5,711
Consumption.....	49	51	44	47	68	43	47	48	33	30	29	32	46	56	59	46	50	1,031
Percentage.....	18.49	17.47	16.73	16.55	22.22	17.91	18.88	21.82	12.22	13.27	13.49	15.40	16.28	17.93	17.52	13.10	13.58	18.05
WHOLE STATE.																		
Total deaths, stated causes	3,871	4,186	4,077	4,110	3,903	4,258	4,231	4,218	4,596	4,669	4,804	5,096	5,099	5,330	5,798	6,321	6,594	91,477
Consumption.....	597	580	529	650	655	661	676	637	642	706	737	766	739	781	826	710	800	14,911
Percentage.....	15.41	13.86	12.96	15.79	16.78	15.52	15.98	15.10	14.01	15.12	15.33	15.03	14.34	14.42	14.12	11.19	12.13	16.30

TABLE LXX.

Mortality in the State from Consumption, with the Percentage of the Whole Number of Deaths from all Causes, and the Sex, Parentage and Locality, in the Aggregate of Different Periods, 1865-1888.

YEARS.	Total Deaths from Consumption.	Average Percentage.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
			Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
1865-1869.....	2,690	17.29	1,244	1,446	1,575	1,115	116	226	233	909	1,004	202
1870-1874.....	2,808	14.43	1,217	1,591	1,507	1,301	99	216	159	924	1,175	235
1875-1879.....	3,279	15.04	1,436	1,843	1,499	1,780	106	192	195	1,060	1,473	253
1880-1884.....	3,590	14.16	1,597	1,993	1,399	2,191	120	308	229	1,138	1,725	170
1885.....	781	14.45	382	399	315	466	12	45	47	273	348	56
1886... ..	826	14.12	382	444	308	518	23	43	57	276	368	59
1887.....	710	11.19	312	398	266	444	20	34	41	246	323	46
1888.....	800	12.13	391	409	284	516	28	55	32	273	362	50
Total.....	15,484	14.56	6,961	8,523	7,153	8,331	524	1,019	993	5,099	6,778	1,071

The proportion of deaths from consumption to the *population* in the different counties and the city of Providence, during the last four years, may be seen in the following summaries :

CONSUMPTION. *Proportion of Deaths to Population.*

For four years, 1885 to 1888, inclusive.

	Persons, One Death to every	In every 1,000 of Population.
Bristol County.....	614.....or.....	1.63
Kent County.....	515.....or.....	1.94
Newport County.....	692.....or.....	1.45
Providence County Towns†.....	406.....or.....	2.46
Providence City.....	345.....or.....	2.90
Washington County.....	434.....or.....	2.30
Whole State.....	334.....or.....	2.60

* Providence city not included.

† Including Pawtucket and Woonsocket.

1888.

	Persons, One Death to every		In every 1,000 of Population.
Bristol County.....	421.....	or.....	2.38
Kent County.....	412.....	or.....	2.43
Newport County.....	942.....	or.....	1.06
Providence County Towns*.....	416.....	or.....	2.40
Providence City.....	345.....	or.....	2.90
Washington County.....	459.....	or.....	2.18
Whole State.....	404.....	or.....	2.48

CROUP.

There were 79 decedents from croup, in Rhode Island, in 1888.

Sex.—Of the 79 decedents from croup, in 1888, there were 43 males and 36 females, a proportion of 120 males to each 100 females, which is in accordance with the rule of twenty-four years, in which there has been a preponderance of males.

Parentage.—There were 34 decedents of American parentage, and 45 of foreign parentage. The proportions were in the ratio of 132 of foreign to each 100 of American parentage.

Age.—There were 11 of the decedents under one year of age, 17 of one year and under two, 39 of two years and under five, and 12 between five and ten, and none above ten years of age.

Season.—

First Quarter.....	35	Third Quarter.....	11
Second Quarter.....	15	Fourth Quarter.....	18
<hr/>			
First half year.....	50	Second half year.....	29
Total.....	79		

The following Table will exhibit various facts in relation to mortality from croup, for twenty-four years :

* Including Pawtucket and Woonsocket.

TABLE LXXI.

Mortality from Croup, with the Percentage of the Whole Number of Deaths, the Sex, Parentage and Localities, for 24 years, from 1865 to 1888, inclusive.

YEARS.	CROUP.											
	Number of Deaths.	Percentage.	SEX.		PARENTAGE.		STATE DIVISIONS.					
			Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
1865.....	94	.92	44	50	32	62	16	4	2	40	29	3
1866.....	53	1.89	26	27	22	31	3	3	3	18	23	3
1867.....	50	1.86	25	25	21	29	3	1	7	20	19	...
1868.....	30	1.14	13	17	14	16	.....	2	3	14	11	.....
1869.....	41	1.33	19	22	14	27	.....	4	5	10	19	3
1870.....	53	1.70	29	24	25	28	.....	3	1	20	27	2
1871.....	72	2.33	39	33	31	41	6	8	2	20	35	1
1872.....	66	1.70	37	29	17	49	4	2	3	28	27	2
1873.....	68	1.62	30	38	35	33	2	7	3	33	22	1
1874.....	65	1.59	39	26	38	27	.....	10	1	24	29	1
1875.....	96	2.33	53	43	43	53	1	3	4	26	56	6
1876.....	102	2.61	50	52	42	60	1	6	.....	26	65	4
1877.....	95	2.23	48	47	34	61	4	3	1	47	40	.....
1878.....	93	2.20	45	48	43	50	14	3	7	25	39	5
1879.....	96	2.28	58	38	40	56	3	6	15	25	43	4
1880.....	66	1.45	32	34	27	39	3	3	4	20	30	6
1881.....	101	2.16	45	56	38	63	2	6	4	38	49	2
1882.....	77	1.60	41	36	32	45	1	2	6	33	32	3
1883.....	71	1.40	32	39	33	38	1	6	4	25	35	.....
1884.....	80	1.55	40	40	32	48	2	11	4	29	34	.....
1885.....	94	1.74	45	49	42	52	4	8	6	46	28	2
1886.....	91	1.53	45	45	39	51	2	18	12	24	32	2
1887.....	113	1.79	58	55	43	70	9	12	4	43	39	6
1888.....	79	1.19	43	36	34	45	4	2	7	34	27	5
Total, 24 years..	1,845	1.73	936	909	771	1,074	85	133	108	668	790	61

* Excepting Providence city.

DIARRHŒA AND DYSENTERY.

There were 157 decedents from diarrhœa and dysentery, in 1888.

Sex.—Of the 157, 69 were males, and 88 were females, or in the ratio of about 72 males to each 100 females.

Parentage.—There were, of the 157 decedents, 97 of American parentage, and 60 of foreign parentage, or a proportion of about 162 of foreign parentage to every 100 of American.

Age.—There were 79 of the decedents from diarrhœa and dysentery under 5 years of age, and there were 42 over 70 years of age, leaving 36 for all the years between 5 and 70.

Locality.—Of the 157 decedents, 125 were in Providence county. Only 3 deaths from diarrhœa were reported from each of Kent and Washington counties, and one death from dysentery from Bristol county.

Season.—There were 101 of the deaths from diarrhœa and dysentery that occurred during the months of July, August and September.

The following Table will show the deaths from diarrhœa and dysentery, with the percentage, sex, parentage, etc., for each of twenty-four years, beginning with 1865 :

TABLE LXXII.

Mortality in the State from Diarrhœa and Dysentery, from 1865 to 1888, inclusive.

YEARS.	Total Deaths.	Per cent.	SEX.		PARENTAGE.		STATE DIVISIONS.					
			Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
1865	264	8.20	136	128	133	131	9	24	26	87	96	22
1866	197	6.63	104	93	95	102	7	11	15	67	72	25
1867	157	5.43	79	78	80	77	8	9	28	49	58	5
1868	97	3.33	46	51	42†	55	2	7	20	26	39	3
1869	124	3.67	64	60	60	64	9	12	14	35	47	7
1870	102	3.15	60	42	46	56	.....	7	12	38	38	7
1871	88	2.63	48	40	43	45	3	3	5	34	40	3
1872	183	4.31	112	71	81	102	5	17	11	63	87	.....
1873	100	2.27	47	53	70	30	8	13	3	30	44	2
1874	103	2.44	50	53	51	52	2	7	3	22	67	2
1875	106	2.46	60	46	60	46	9	6	1	34	51	5
1876	122	2.96	66	56	52	70	3	6	2	41	65	5
1877	142	3.19	64	78	73	69	8	6	9	54	55	10
1878	93	2.09	42	51	51	42	5	8	2	34	39	5
1879	97	2.17	48	49	47	50	9	6	10	27	42	3
1880	98	2.03	49	49	50	48	4	6	10	32	42	4
1881	119	2.37	56	63	54	65	2	4	3	47	57	6
1882	158	3.11	75	83	69	89	2	4	23	57	64	3
1883	182	3.45	86	96	88	94	7	7	16	74	75	3
1884	153	2.98	74	79	69	84	10	5	11	66	56	5
1885	120	2.23	61	59	51	69	7	6	6	62	35	4
1886	159	2.72	64	95	70	89	7	11	1	73	59	8
1887	199	3.11	107	92	70	129	6	16	4	92	72	9
1888	157	2.31	69	88	97	60	6	8	3	54	71	15
Total	3,330	3.12	1,667	1,663	1,602	1,718	138	209	243	1,198	1,871	161

† One of unknown parentage included.

* Excluding Providence city.

DIPHTHERIA.

The number of deaths from diphtheria, in 1888, was 191, which was 96 less than in 1887.

Sex.—Of the 191 decedents, 87 were males, and 104 were females, or a proportion of 84 males to each 100 females.

Parentage.—There were 79 of American, and 112 of foreign parentage, a proportion of about 41 of American and 59 of foreign in each 100 decedents.

Season.—There were 55 deaths from diphtheria in the first quarter, 44 in the second quarter, 39 in the third quarter, and 53 in the fourth quarter.

Age.—There were 110 deaths under five years of age, 69 between five and ten, 11 between ten and fifty, and one between seventy and eighty.

Locality.—Of the 191 decedents, 156 were in Providence county; 3 in Kent county; 13 in Bristol county; 9 in Newport county; and 10 in Washington county.

The following Table shows the mortality in the State from diphtheria, for each of twenty-four years, beginning with 1865, also the percentage of deaths, the sex, parentage, etc.:

TABLE LXXIII.

Mortality in the State from Diphtheria—1865–1888.

YEARS	Whole Number of Deaths.	DIPHTHERIA.											
		Number of Deaths.	Percentage.	SEX.		PARENTAGE		DIVISIONS OF THE STATE.					
				Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
1865....	3,405	82	2.54	41	41	62	20	8	11	6	19	16	22
1866 ...	2,970	64	2.29	26	38	36	28	1	8	17	16	11	11
1867....	2,889	31	1.15	14	17	19	12	4	4	5	9	5	4
1868....	2,912	20	.76	8	12	11	9	.....	2	3	8	5	2
1869....	3,382	33	1.07	18	15	19	14	.....	5	2	3	13	10
1870....	3,238	33	1.06	17	16	18	15	.....	9	3	4	10	7
1871....	3,344	57	1.84	23	34	29	28	1	14	.....	12	21	9
1872 ...	4,247	48	1.24	24	24	35	13	.....	4	6	7	27	4
1873 ...	4,403	45	1.08	24	21	35	10	.....	2	7	12	23	1
1874....	4,229	59	1.45	30	29	37	22	2	11	4	15	20	7
1875....	4,317	33	.80	17	16	18	15	1	4	3	8	14	8
1876....	4,116	159	4.07	77	82	69	90	1	2	9	29	111	7
1877....	4,450	492	11.56	239	253	233	259	12	44	2	122	295	17
1878....	4,441	435	10.28	224	211	201	234	21	29	23	106	245	11
1879....	4,472	259	6.14	121	138	143	116	7	19	20	95	106	12
1880....	4,829	152	3.40	73	79	75	77	3	6	2	63	61	17
1881....	5,016	216	4.63	106	110	118	98	10	16	8	53	116	13
1882....	5,074	101	2.10	48	53	55	46	.....	3	4	29	48	17
1883....	5,282	95	1.88	39	56	45	50	1	7	3	26	54	4
1884 ...	5,141	119	2.31	65	54	47	72	8	1	9	39	58	4
1885....	5,389	99	1.83	47	52	48	51	5	5	6	39	37	7
1886....	5,849	228	3.90	98	130	101	127	20	21	23	64	98	2
1887....	6,340	287	4.53	135	152	101	186	15	11	4	114	108	35
1888....	6,594	191	2.86	87	104	79	112	13	3	9	58	98	10
Total, 24 yrs.	106,329	3,338	3.14	1,601	1,737	1,634	1,704	133	241	178	950	1,600	236

FEVER, MALARIAL.

The number of deaths, during 1888, from diseases classed as fever malarial, was 71. The number in 1887 was 85. In 1886 there were 43; in 1885, 30; in 1884, 25; in 1883, 12.

* Not including Providence city.

Sex.—Of the 71 decedents from malarial fevers, in 1888, 33 were males and 38 were females, or 87 males to every 100 females.

Parentage.—There were, of the 71 decedents from malarial diseases 24 of American parentage, and 47 of foreign, or 196 of foreign parentage to every 100 of American.

Season.—The deaths from malarial diseases occurred in the different seasons of the year as follows :

First Quarter	9	Third Quarter	27
Second Quarter.....	21	Fourth Quarter.....	14
.....	—	—
First half of year.....	30	Second half of year.....	41
Whole year.....	71		

Age.—The number of decedents in the different periods was as follows :

Under 5 years of age.....	14
From 5 to 20 years of age.....	11
From 20 to 40 years of age.....	16
From 40 to 60 years of age.....	16
60 and over.....	14
	—
	71

It will be seen that the disease was most fatal in the early and late periods of life.

Localities—Bristol county, 1 ; Kent county, 2 ; Newport county, 3 ; Providence county, 65 ; Washington county, none.

FEVERS, TYPHOID, ETC.

The number of decedents, whose deaths were returned as having been caused by “fever” of some form, not malarial nor cerebro-spinal, was 235. Deaths from puerperal fever are not included.

The term “fever” includes the following types of febrile diseases, as may be seen in Table VII, on page 20 : “fevers unspecified,” 11 ; “typhoid,” 224.

The following Table exhibits, for each of the last twenty-four years, the number and the percentage, and the sex and parentage of the decedents from such fevers, and the number in each division of the State :

TABLE LXXIV.

YEARS.	TYPHOID FEVER, ETC.											
	Number of Deaths.	Percentage.	SEX.		PARENTAGE.		STATE DIVISIONS.					
			Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
1865.....	229	6.4	114	115	149	80	8	17	22	82	79	21
1866.....	150	6.0	73	77	82	68	7	5	32	54	45	7
1867.....	119	4.1	60	59	84	35	9	10	17	47	31	5
1868.....	84	2.9	45	39	57	27	4	5	7	30	23	15
1869.....	101	3.0	53	48	79	22	7	7	1	37	33	16
1870.....	153	4.7	66	87	80	73	5	11	14	57	49	17
1871.....	125	3.7	60	65	69	56	2	8	10	41	51	13
1872.....	179	4.2	87	92	91	86	4	12	6	75	65	17
1873.....	172	3.9	73	99	113	59	4	9	9	61	56	33
1874.....	117	2.8	57	60	56	61	1	10	3	37	58	8
1875.....	147	3.4	73	74	90	57	1	4	6	49	69	18
1876.....	126	3.0	65	61	71	55	5	9	13	44	33	22
1877.....	134	3.0	63	71	65	69	8	10	8	52	44	12
1878.....	150	3.4	68	82	77	73	13	13	6	59	47	12
1879.....	114	2.7	47	67	63	51	4	13	6	44	40	7
1880.....	158	3.4	74	84	94	64	8	12	5	66	52	15
1881.....	143	2.8	74	69	74	69	4	13	14	58	41	13
1882.....	229	4.7	111	118	100	129	6	11	5	56	145	6
1883.....	258	4.8	146	112	117	141	9	16	10	82	134	7
1884.....	165	3.2	83	82	78	87	7	7	12	66	64	9
1885.....	158	2.9	71	87	70	88	6	14	8	69	53	8
1886.....	169	2.9	78	91	76	93	6	8	11	66	70	8
1887.....	127	2.0	67	60	58	69	2	14	9	49	38	15
1888.....	235	3.6	125	110	88	147	20	24	14	66	102	9
Total, 24 years..	3,742	3.4	1,833	1,909	1,981	1,761	150	162	248	1,347	1,422	313

During the period of twenty-four years, 1865 to 1888, inclusive, the proportions of the sexes of the decedents from "fever," in Rhode Island, were 105 females to every 100 males.

Parentage.—There were 88 decedents from fever, of American parentage, in 1888, and 147 of foreign parentage, a proportion of about 60 of foreign and 40 of American in every 100 decedents.

* Providence city not included.

The following Table shows the number of decedents from fevers, in each division of ages, in each of the last twenty-four years, in the State of Rhode Island :

TABLE LXXV.

TYPHOID FEVER.		PERIODS OF LIFE.										
YEARS.		Under 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 & over.	Not stated.
1865.....		35	18	46	54	30	14	18	7	5	2	....
1866.....		23	10	21	26	21	16	9	14	10	....	....
1867.....		17	6	24	33	12	11	8	4	2	2	1
1868.....		10	7	10	21	8	8	10	4	5	....	....
1869.....		10	8	14	28	9	7	9	8	6	2	....
1870.....		15	13	28	39	16	20	7	7	6	1	....
1871.....		13	10	20	28	18	16	9	4	5	2	....
1872.....		17	18	34	54	20	9	12	11	3	1	....
1873.....		27	12	34	31	25	13	13	7	8	2	....
1874.....		10	14	26	32	9	5	10	3	6	2	....
1875.....		23	14	19	43	18	10	10	6	4	....	....
1876.....		21	10	15	24	14	9	6	16	6	3	2
1877.....		22	13	13	36	20	8	5	7	2	2	1
1878.....		17	16	27	47	13	11	12	2	3	2	....
1879.....		19	7	14	26	15	6	3	12	8	3	1
1880.....		25	12	24	43	23	12	10	5	3	....	1
1881.....		25	9	19	27	14	11	9	12	11	4	....
1882.....		24	22	44	69	27	14	9	10	9	1	....
1883.....		36	25	46	75	31	12	11	10	8	2	2
1884.....		24	13	19	47	22	9	12	10	5	3	1
1885.....		35	12	16	25	26	11	11	12	6	4	....
1886.....		29	9	25	41	20	14	17	8	5	1	....
1887.....		24	8	16	31	16	10	5	8	4	4	1
1888.....		27	27	42	75	29	16	12	3	4	....	....
Totals.....		526	313	595	965	456	272	237	190	134	43	10

Of the 3,742 decedents from fever, during the last twenty-four years, 1,434 were under 20 years of age, and 1,421 were between 20 and 40 years of age. There was, therefore, over 38 per cent. of the decedents under 20 years of age, and nearly the same per cent. between 20 and 40 ; or about 75 per cent. of the whole number of decedents from typhoid fevers were under 40 years of age.

TABLE LXXVI.

Comparative Exhibit of the Percentages of Deaths from Typhoid Fever, to Total Deaths from Specified Causes, in four New England States, for thirteen years, 1876-1888.

	1876	1877	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888
Rhode Island.....	3.0	3.0	3.4	2.7	3.4	2.8	4.7	4.8	3.2	2.9	2.9	2.0	3.6
Massachusetts.....	2.7	2.7	2.3	1.9	2.5	2.9	2.9	2.3	2.4	2.0	2.1	2.3	2.2
Connecticut.....	3.6	3.3	2.7	1.8	2.5	2.5	3.1	2.1	2.5	1.1	2.2	1.2	....
Vermont.....	4.2	4.8	3.4	2.7	3.5	5.5	3.4	3.1	....	....	2.5	2.5	....

DISEASES OF THE HEART.

The number of decedents from diseases of the heart, as reported in 1888, was 436. The number is larger by 30 than that of 1887.

Sex.—There were 196 male decedents, and 240 female decedents ; a proportion of about 81 males to every 100 females.

Parentage.—Of the 436 decedents from diseases of the heart, in 1888, there were 240 of American parentage, and 196 of foreign, a proportion of 123 of American parentage to every 100 of foreign. This is in accordance with the invariable rule of the whole period of registration.

The following Table exhibits for each of the last twenty-four years, 1865 to 1888, inclusive, the number and percentage, and the sex and parentage of the decedents from diseases of the heart, and the number of the same in each division of the State :

TABLE LXXVII.

YEARS.	DISEASES OF THE HEART.											
	Whole Number.	Per cent.	SEX.		PARENTAGE		DIVISIONS OF THE STATE.					
			Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
1865.....	98	2.88	51	47	65	33	6	5	8	27	47	5
1866.....	115	3.87	58	57	90	25	7	8	10	41	40	9
1867.....	114	3.94	67	47	81	33	4	9	7	37	49	8
1868.....	116	3.96	58	58	89	37	5	8	12	35	52	4
1869.....	128	3.78	75	53	79	49	2	13	11	36	62	4
1870.....	117	3.61	77	40	77	40	4	10	8	35	59	1
1871.....	144	4.30	78	66	91	53	4	7	8	42	77	6
1872.....	189	4.45	104	85	119	70	5	9	10	59	83	13
1873.....	189	4.29	83	106	122	67	4	11	14	48	101	11
1874.....	214	5.06	109	105	150	64	6	6	28	50	106	18
1875.....	186	4.31	84	102	113	73	2	13	22	49	88	12
1876.....	166	4.03	81	80	109	57	9	11	10	38	86	12
1877.....	182	4.09	94	88	110	72	3	7	9	57	93	13
1878.....	166	3.73	88	78	109	57	5	11	15	38	83	14
1879.....	202	4.78	114	88	127	75	8	20	16	38	111	9
1880.....	231	5.03	125	106	146	85	9	21	29	59	104	9
1881.....	264	5.65	131	133	154	110	9	21	24	73	121	16
1882.....	255	5.31	116	139	162	93	8	16	23	55	142	11
1883.....	325	6.20	167	158	179	146	8	27	30	70	172	18
1884.....	255	5.60	135	150	163	122	6	16	25	87	139	12
1885.....	349	6.48	162	187	198	151	13	27	25	94	159	31
1886.....	330	5.20	152	178	184	146	12	20	18	82	168	30
1887.....	406	6.40	205	201	240	166	7	21	36	123	193	26
1888.....	436	6.56	196	240	240	196	11	22	40	122	210	31
Total.....	2,207	4.60	2,615	2,592	3,167	2,040	157	339	438	1,395	2,555	323

Sex.—Of the 5,207 persons deceased from diseases of the heart, in the last twenty-four years, 2,615 were males, and 2,592 were females; or 101 males to each 100 females.

Parentage.—Of the 5,207 decedents, during twenty-four years, 3,167 were of American parentage, and 2,040 of foreign.

* Not including Providence city.

The proportions would, therefore, stand as follows : To every 100 of foreign parentage there were about 155 of American ; or about 64 American and 36 of foreign parentage in every 100 deaths.

The following Table shows the number of decedents from diseases of the heart, in each divisional period of life, in each of the last twenty four years :

TABLE LXXVIII.

YEARS.	Under 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 and over.	Not stated.
1865	14	4	6	7	22	17	19	9	.....
1866	18	8	14	17	10	23	21	4	.....
1867	11	11	10	13	22	16	27	4	.....
1868	15	5	13	11	14	28	25	5	.....
1869	21	4	14	18	20	22	21	7	1
1870	19	6	11	13	20	21	23	3	1
1871	9	12	10	19	23	36	28	6	1
1872	27	12	22	19	31	36	29	13	.....
1873	19	11	28	18	25	35	42	9	2
1874	20	16	26	21	27	50	40	12	2
1875	14	16	25	20	32	29	41	9	.....
1876	14	10	15	19	20	38	39	10	1
1877	15	11	20	18	27	45	33	13	.....
1878	16	8	18	16	26	36	35	11	.....
1879	19	9	13	25	33	51	36	16	.....
1880	15	10	18	23	38	49	49	28	1
1881	32	13	26	23	37	49	53	21	.....
1882	22	17	24	25	36	51	61	17	2
1883	39	13	21	33	52	65	76	26	.....
1884	15	25	21	32	45	61	50	32	4
1885	38	13	24	42	61	69	78	24	.....
1886	39	18	28	38	52	68	69	18	.....
1887	52	30	23	35	61	79	87	39	.....
1888	39	25	30	54	84	97	74	33	.....
Total	542	307	460	569	818	1,071	1,056	369	15

The proportion of about one-ninth under 20 years of age will be noticed.

The results of twenty-four years of registration, with record of ages

of decedents from diseases of the heart, show in periods of twenty years each of life, the following percentages :

Under 20 years of age	10.6 per cent.
Between 20 and 40.....	15.0 per cent.
Between 40 and 60.....	26.6 per cent.
Between 60 and 80.....	40.8 per cent.
Over 80.....	7.0 per cent.
<hr/>	
	100.0 per cent.

It will be seen that about 41 per cent. of all the deaths from diseases of the heart were of persons over sixty years of age, and under eighty.

Diseases of the heart have acquired large importance as a cause of death. From 28.8 in every 1,000 deaths from all causes, in 1865, heart diseases have gradually increased to about 64 in every 1,000, in 1888.

INSANITY.

There were 43 deaths from insanity, in 1888, a decrease of 21 from 1887. The percentage to the whole number of deaths was a trifle over six-tenths of one per cent. These deaths occurred chiefly at the Cranston institutions, and in the Butler hospital. One death occurred in Bristol county, and two in Kent county.

Sex.—There were 21 male and 22 female decedents.

Parentage.—The number of American decedents from insanity was 24, and of foreign parentage 19.

The following Table shows the mortality in the State from insanity, for each of twenty-four years, with sex, parentage, etc., from 1865 to 1888, inclusive :

TABLE LXXIX.

Mortality in the State from Insanity.

YEARS.	Number of Deaths. from Insanity.	Percentage.	SEX.		PARENTAGE.		STATE DIVISIONS.					
			Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
1865.....	20	.59	9	11	16	4	.....	3	.....	2	14	1
1866.....	13	.47	7	6	10	3	.....	2	.....	1	10	..
1867.....	14	.52	7	7	12	2	.....	2	.....	...	11	1
1868.....	13	.44	7	6	8	5	.....	1	.....	2	10	.....
1869.....	14	.45	6	8	9	5	.....	.....	3	2	9	.....
	74	.49	36	38	55	19	.....	8	3	7	51	2
1870.....	18	.55	6	12	13	5	.....	.....	1	2	15	.....
1871.....	16	.45	11	5	13	3	.....	.....	1	4	11	.....
1872.....	26	.61	11	15	16	10	3	.....	1	12	10	.....
1873.....	19	.45	8	11	11	8	.....	.....	2	5	12	.....
1874.....	13	.32	7	6	11	2	.....	1	.....	3	9	.....
	92	.48	43	49	64	28	3	1	5	26	57	.....
1875.....	32	.78	18	14	25	7	.....	1	4	9	16	2
1876.....	12	.28	5	7	9	3	1	2	1	1	6	1
1877.....	19	.49	9	10	9	10	.....	1	.....	5	12	1
1878.....	22	.50	5	17	16	6	.....	.....	1	3	17	1
1879.....	17	.40	11	6	10	7	.....	.....	.....	5	11	1
	102	.49	48	54	69	33	1	4	6	23	62	6
1880.....	19	.39	9	10	13	6	.....	1	2	6	9	1
1881.....	32	.63	15	17	22	10	1	1	3	10	16	1
1882.....	23	.45	9	14	18	5	.....	1	.....	8	12	2
1883.....	29	.55	12	17	17	12	1	2	.....	7	18	1
1884.....	36	.69	17	19	24	12	2	3	.....	21	9	1
	139	.54	62	77	94	45	4	8	5	52	64	6
1885.....	35	.67	16	19	18	17	.....	.....	2	23	10	..
1886.....	49	.83	21	28	28	21	3	1	1	37	7	.....
1887.....	64	1.01	35	29	33	31	1	.....	1	56	.....	6
1888.....	43	.64	21	22	24	19	1	2	.....	33	7	.....
Total, 24 years..	598	.56	282	316	385	213	13	24	23	257	261	20

* Providence city not included.

TABLE LXXX.

Mortality in the State from Kidney Diseases, with the Percentage of the Whole Number of Deaths, Sex, Parentage and Locality for twenty-four years, from 1865 to 1888, inclusive.

YEARS.	Number of Deaths from Kidney Diseases.	Per cent.	SEX.		PARENTAGE.		STATE DIVISIONS.					
			Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
1865	13	.39	12	1	10	3	1	.....	5	.....	5	2
1866	16	.58	10	6	12	4	1	1	2	5	7	.....
1867	32	1.19	22	10	23	9	2	1	3	7	17	2
1868	24	.80	18	6	15	9	1	.....	5	3	12	3
1869	32	.95	21	11	20	12	1	2	4	8	16	1
	117	.76	83	34	80	37	6	4	19	23	57	8
1870	31	.96	23	8	21	10	1	3	6	5	14	2
1871	43	1.39	27	16	31	12	2	3	3	10	21	4
1872	55	1.42	30	25	29	26	4	2	2	11	34	2
1873	66	1.57	38	28	40	26	.....	3	5	19	31	8
1874	66	1.62	36	30	41	25	4	3	3	11	44	1
	261	1.34	154	107	162	99	11	14	19	56	144	17
1875	65	1.58	36	29	46	19	1	.....	4	16	42	2
1876	50	1.28	22	28	32	18	1	1	7	10	28	3
1877	67	1.57	40	27	35	32	2	1	.....	14	49	1
1878	80	1.89	50	30	49	31	4	3	8	21	47	2
1879	79	1.88	51	28	44	35	1	3	1	23	43	8
	341	1.56	199	142	206	135	9	8	15	84	209	16
1880	91	2.02	52	39	51	40	1	5	10	27	46	2
1881	79	1.69	40	39	47	32	7	5	4	14	48	1
1882	86	1.79	50	36	45	41	2	5	10	15	52	2
1883	129	2.43	72	57	74	55	5	2	17	37	60	8
1884	118	2.29	53	65	66	52	5	11	12	28	54	8
	503	1.98	267	236	283	220	20	28	53	121	260	21
1885	159	2.97	92	67	86	73	8	10	17	31	88	5
1886	155	2.49	85	70	93	62	3	10	22	37	71	12
1887	169	2.66	92	77	90	79	5	6	16	43	92	7
1888	213	3.23	102	111	122	91	10	10	24	46	115	8
Total	1,918	1.80	1,074	844	1,122	796	72	90	185	441	1,036	94

* Providence city not included.

TABLE LXXXI.

Percentage to Whole Number of Deaths, Sex, Parentage and Locality of Decedents from Diseases of the Liver.

YEARS.	Number of Deaths.	Per cent.	SEX.		PARENTAGE		DIVISIONS OF THE STATE.					
			Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
1865	27	.79	19	8	21	6	2	1	4	10	9	1
1866	50	1.68	27	23	38	12	3	5	11	8	14	9
1867	38	1.31	18	20	20	18	4	2	3	10	17	2
1868	31	1.06	20	11	20	11	2	1	11	5	11	1
1869	37	1.09	19	18	23	14	3	2	4	9	16	3
	183	1.19	103	80	122	61	14	11	33	42	67	16
1870	45	1.23	17	28	29	16	.....	4	7	15	12	7
1871	35	1.13	18	17	19	16	4	4	2	6	15	4
1872	35	.82	18	17	17	18	2	3	3	11	15	1
1873	45	1.02	20	25	26	19	4	2	1	18	16	4
1874	40	.95	21	19	26	14	3	3	3	11	16	4
	200	1.03	94	106	117	83	13	16	16	61	74	20
1875	47	1.09	26	21	19	28	5	2	3	10	26	1
1876	45	1.09	26	19	27	18	1	5	5	11	18	5
1877	52	1.17	23	29	31	21	1	.....	7	16	24	4
1878	49	1.10	25	24	32	17	8	1	6	14	18	2
1879	52	1.24	27	25	31	21	4	4	2	14	22	6
	245	1.14	127	118	140	105	19	12	23	65	108	18
1880	58	1.27	29	29	40	18	4	3	8	15	25	8
1881	46	.92	30	16	21	25	2	2	6	8	24	4
1882	62	1.22	34	28	36	26	3	5	10	17	24	3
1883	51	.94	27	24	20	31	5	6	4	16	18	2
1884	48	.93	22	26	23	25	5	3	5	2	31	2
	265	1.06	142	123	140	125	19	19	33	58	122	14
1885	61	1.13	24	37	32	29	2	6	6	21	24	2
1886	54	.92	29	25	26	28	4	4	4	14	28	.....
1887	86	1.35	40	46	38	48	3	5	3	31	39	5
1888	68	1.03	38	30	36	32	1	5	6	28	26	2
Total	1,162	1.09	597	565	651	511	75	78	124	320	488	77

* Providence city not included.

TABLE LXXXII.

*Comparative Mortality between Kidney and Liver Diseases and Dropsy
for thirty-six years—1853 to 1888.*

YEARS.	DEATHS FROM KIDNEY DISEASES			DEATHS FROM LIVER DISEASES			TOTAL DEATHS FROM KIDNEY AND LIVER DISEASES.			DEATHS FROM DROPSY.			Excess or Diminution of Dropsy in refer- ence to Kidney and Liver Diseases.	Per cent. of Deaths from Dropsy to all.
	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.		
1853-1857.	26	20	6	51	28	23	77	48	29	208	89	119	+131	2.21
1858-1862.	71	38	33	168	87	81	239	125	114	270	113	157	+31	2.07
1863-1867.	99	69	30	191	104	87	290	173	117	371	169	202	+81	2.10
1868.....	24	18	6	31	20	11	55	38	17	49	23	26	Decrease 6	1.68
1869.....	32	21	11	37	19	18	69	40	29	53	23	30	16	1.57
1870.....	31	23	8	45	17	28	76	40	36	61	32	29	15	1.88
1871.....	43	27	16	35	18	17	78	45	33	56	25	31	22	1.67
1872.....	55	30	25	35	18	17	90	48	42	55	23	32	25	1.29
1868-1872.	185	119	66	183	92	91	368	211	157	274	126	148	94	1.62
1873.....	66	38	28	45	20	25	111	58	53	60	32	28	51	1.36
1874.....	66	36	30	40	21	19	106	57	49	39	18	21	67	.92
1875.....	65	36	29	47	26	21	112	62	50	56	18	38	56	1.29
1876.....	50	22	28	45	26	19	95	48	47	66	32	34	29	1.61
1877.....	67	40	27	52	23	29	119	63	56	63	25	38	56	1.42
1873-1877.	314	172	142	229	116	113	543	288	255	284	125	159	259	1.32
1878.....	81	51	30	49	25	24	130	76	54	38	21	17	92	.86
1879.....	81	52	29	52	27	25	133	79	54	50	26	24	83	1.12
1880.....	91	52	39	58	29	29	149	81	68	37	15	22	112	.77
1881.....	79	40	39	46	30	16	125	70	55	47	23	24	78	.94
1882.....	88	47	41	62	34	28	150	81	69	50	22	28	100	.99
1878-1882.	420	242	178	267	145	122	687	387	300	222	107	115	465	.94
1883.....	117	67	50	51	27	24	168	94	74	47	21	26	121	.89
1884.....	133	58	75	52	24	28	185	82	103	40	20	20	145	.78
1885.....	168	95	73	61	24	37	229	119	110	44	30	14	185	.82
1886.....	163	91	72	71	38	33	234	129	105	49	20	29	185	.84
1887.....	169	92	77	86	40	46	255	132	123	35	14	21	220	.55
1883-1887.	750	403	347	321	153	168	1,071	556	515	215	105	110	856	.78
1888.....	213	102	111	68	38	30	281	140	141	48	18	30	233	.73
Totals...	2,078	1,165	913	1,478	763	715	3,556	1,928	1,628	1,892	852	1,040	1,664	1.55

TABLE LXXXIII.

Mortality in the State from Old Age, with the Percentage of the Whole Number of Deaths, Sex, Parentage and Locality, for twenty-four years, from 1865 to 1888, inclusive.

YEARS.	Number of Deaths, from Old Age.	Per cent.	SEX.		PARENTAGE		DIVISIONS OF THE STATE.					
			Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
1865.....	152	4.74	60	92	119	33	4	13	24	38	53	20
1866.....	178	6.36	64	114	140	38	9	20	30	43	56	20
1867.....	193	6.68	86	107	145	48	18	23	30	57	48	17
1868.....	206	7.85	60	146	157	49	7	19	39	52	62	27
1869.....	217	7.04	79	138	167	50	11	16	34	72	50	34
	946	6.53	349	597	728	218	49	91	157	262	269	118
1870.....	204	6.58	77	127	155	49	10	24	24	59	51	36
1871.....	232	7.44	94	138	173	59	14	24	34	56	70	34
1872.....	233	6.02	93	140	173	60	10	14	26	75	69	39
1873.....	254	6.07	107	147	177	77	14	22	39	71	79	29
1874.....	223	5.46	80	143	160	63	14	20	29	61	71	28
	1,146	6.32	451	695	838	308	62	104	152	322	340	166
1875.....	216	5.25	93	123	150	66	9	23	33	69	50	28
1876.....	241	6.18	107	134	177	64	12	14	38	65	71	41
1877.....	213	5.00	96	117	145	68	12	23	29	57	63	29
1878.....	222	5.25	84	138	172	50	15	8	32	76	61	30
1879.....	220	5.22	82	138	152	68	14	19	26	69	67	25
	1,112	5.38	462	650	796	316	62	87	158	336	321	148
1880.....	273	5.95	121	152	186	87	12	20	34	90	73	44
1881.....	247	5.20	101	146	167	80	12	24	36	93	72	10
1882.....	283	5.89	110	173	190	93	20	25	40	106	79	18
1883.....	275	5.22	105	170	184	91	17	18	44	91	84	21
1884.....	293	5.68	101	192	196	97	16	20	39	106	86	26
	1,371	5.60	538	833	923	448	77	107	193	486	394	114
1885.....	267	4.95	86	181	183	84	9	32	47	87	70	22
1886.....	276	4.69	101	175	181	95	16	24	36	100	73	27
1887.....	278	4.38	103	175	167	111	17	19	29	109	76	28
1888.....	290	4.35	108	182	198	92	16	26	25	124	64	35
Total	5,686	5.34	2,198	3,488	4,014	1,672	308	490	797	1,826	1,607	658

* Providence city not included.

PNEUMONIA.

There were 508 decedents from pneumonia, in 1888. The number is 20 more than in 1887.

The proportion to whole number of deaths was 7.7 per hundred, the same as in 1887. In 1885 it was 8.6 in every 100; and in 1886 8.2 in every 100.

Sex.—Of the 508 decedents from pneumonia, and including congestion of the lungs, 274 were males and 234 were females; or about 120 males to each 100 females.

Parentage.—By parentage there were 227 of American and 281 of foreign parentage. The proportion of decedents from pneumonia was about 81 of American to each 100 of foreign parentage.

Season.—There were 313, or over one-half, of the deaths that occurred during the first four months of the year. The largest mortality by months was 98 in March, and 76 in April.

The following Table shows, for each of the last twenty-four years, the number and the percentage, with the sex and the parentage of the decedents from pneumonia; and the number in each year, in each division of the State:

TABLE LXXXIV.

YEARS.	PNEUMONIA.											
	Whole Number.	Per cent.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
			Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
1865.....	175	5.1	80	95	110	65	8	11	21	49	74	12
1866.....	193	6.5	94	99	127	66	13	17	13	50	81	10
1867.....	172	5.9	68	104	103	69	8	12	12	56	68	16
1868.....	191	6.6	99	92	120	71	9	5	16	54	92	15
1869.....	190	5.6	104	86	110	80	7	10	10	63	83	12
1870.....	182	5.6	102	80	96	86	6	12	15	55	78	16
1871.....	218	6.5	104	114	129	89	12	21	11	68	85	21
1872.....	229	5.4	119	110	125	104	11	1	9	74	120	14
1873.....	234	5.3	127	107	143	91	11	9	10	65	123	16
1874.....	250	5.9	118	132	143	107	6	13	7	73	136	15
1875.....	400	9.3	199	201	243	157	14	27	25	105	198	31
1876.....	339	8.2	164	175	162	177	13	23	16	97	163	27
1877.....	226	5.1	104	122	127	99	10	7	14	81	98	16
1878.....	317	7.1	143	174	176	141	10	11	18	110	140	28
1879.....	311	7.4	148	163	163	148	7	15	15	103	156	15
1880.....	364	7.9	180	184	177	187	26	16	18	92	192	20
1881.....	327	6.5	177	150	190	137	10	23	17	81	174	22
1882.....	344	7.2	178	166	163	181	10	22	24	91	176	21
1883.....	400	7.8	192	208	198	202	19	21	34	108	204	14
1884.....	363	7.1	167	196	192	171	10	13	17	125	172	26
1885.....	465	8.6	214	251	271	194	15	20	33	151	227	19
1886.....	481	8.2	232	249	234	247	17	29	37	161	209	28
1887.....	488	7.7	260	228	227	261	13	27	39	142	227	40
1888.....	508	7.7	274	234	227	281	16	37	29	171	219	36
Total, 24 years..	7,367	6.9	3,647	3,720	3,956	3,411	281	402	460	2,234	3,500	490

Sex.—Of the 7,367 decedents from pneumonia, in twenty-four years, 1865 to 1888, inclusive, 3,647 were males and 3,720 were females; a proportion of 102 females to every 100 males.

Parentage.—In relation to parentage, there were of the 7,367 decedents, 3,956 of American and 3,411 of foreign; or 116 of American parentage to every 100 of foreign.

* Providence city not included.

TABLE LXXXV.

Exhibiting the Number of Decedents from Pneumonia, in each of the several Periods of Life, during each of the last twenty-four years, from 1865 to 1888, inclusive.

YEARS.	Under 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 and over.	Not stated.
1865.....	65	4	2	....	14	11	15	17	21	21	5	....
1866.....	57	4	4	5	12	10	14	21	25	32	9	....
1867.....	57	9	2	3	10	11	13	16	25	18	12	1
1868.....	70	4	3	3	15	8	16	13	19	27	13	....
1869.....	64	11	1	2	11	12	9	28	25	16	11	...
1870.....	84	6	5	4	6	7	8	14	20	19	8	1
1871.....	71	7	2	7	10	17	16	16	35	17	19	1
1872.....	83	5	1	7	17	20	19	22	24	19	11	1
1873.....	105	4	8	3	10	14	16	17	24	23	10	....
1874.....	76	9	4	6	17	17	25	21	40	27	8	....
1875.....	120	9	3	8	22	30	35	39	61	43	28	2
1876.....	116	5	4	3	20	20	32	35	48	39	17	....
1877.....	79	2	....	7	15	15	24	27	22	24	9	2
1878.....	115	9	4	10	14	17	28	20	42	45	13	....
1879.....	102	8	1	3	14	27	26	35	38	38	9	...
1880.....	95	18	3	16	14	33	37	46	47	43	12	....
1881.....	102	4	2	5	15	22	26	45	48	31	26	1
1882.....	71	3	4	14	22	36	49	33	41	46	21	4
1883.....	88	15	2	13	32	33	40	53	49	46	27	2
1884.....	108	14	5	11	23	34	24	32	53	37	23	4
1885.....	121	9	10	8	23	29	50	49	76	59	29	2
1886.....	111	10	7	19	32	35	50	58	74	55	30	....
1887.....	132	15	7	7	32	43	51	56	64	53	28	....
1888.....	103	20	5	15	49	48	61	62	70	54	21	....
Total.....	2,190	204	89	179	453	549	684	775	991	827	409	21

Age.—Of the 7,367 decedents from pneumonia, during the period of twenty-four years, 2,190, or nearly one-third, were under five years of age. During the periods of life of over fifty years of age the number of decedents was 3,022, or about 40 per cent. of the whole number.

The following summary will present the percentages in round numbers :

Under five years of age.....	30 per cent.
Five years and under twenty.....	6 per cent.
Twenty years and under fifty.....	24 per cent.
Fifty years and over.....	40 per cent.

SCARLATINA.

The number of deaths returned as having been caused by scarlatina, in 1888, was 207. The number is 59 less than in 1887.

Sex.—Of the 207 decedents from scarlatina 101 were males and 106 were females ; or 105 females to every 100 males.

Parentage.—There were 91 of American parentage, and 116 of foreign ; a proportion of about 128 of foreign parentage to every 100 of American.

During a period of twenty-four years there were 1,705 decedents from scarlatina of American parentage, and 2,072 decedents of foreign ; or a proportion of 121 of foreign to each 100 of American parentage.

The following Table will present the statistics of scarlatina for the last thirty-four years, from 1855 to 1888, inclusive, the number and percentage and sex of the decedents from scarlatina, and the number from scarlatina in each division of the State. It also shows, from 1865 to 1888, inclusive, the *parentage* of the decedents from scarlatina :

TABLE LXXXVI.

YEARS.	SCARLATINA.											
	Whole Number.	Per cent.	SEX.		PARENTAGE.		DIVISIONS OF THE STATE.					
			Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
10 yrs., 1855-1864.	1,256	4.9	611	655	.....	.....	46	62	189	334	568	57
1865.....	255	7.5	130	125	134	121	33	17	3	86	108	8
1866.....	28	0.9	15	13	12	16	5	.....	8	12	3	.....
1867.....	14	0.5	6	8	10	4	1	.....	1	2	10	.....
1868.....	93	3.2	47	46	32	61	2	3	3	34	50	1
1869.....	286	8.4	126	160	128	158	17	23	12	72	138	34
1870.....	75	2.3	37	38	28	47	1	6	3	22	35	8
1871.....	66	1.9	41	25	31	35	1	3	1	37	21	13
1872.....	54	1.2	22	31	22	31	.....	1	4	27	19	2
1873.....	287	6.5	124	163	163	124	4	2	42	80	132	27
1874.....	462	10.9	231	231	176	296	27	17	1	133	268	16
1875.....	185	4.3	85	100	121	56	8	30	3	35	94	15
1876.....	80	1.9	34	46	42	38	3	2	7	21	35	12
1877.....	62	1.4	26	36	29	33	14	4	3	21	12	8
1878.....	86	1.9	41	45	35	51	3	5	3	14	57	4
1879.....	311	7.4	164	147	130	181	3	6	4	37	255	6
1880.....	463	10.0	215	253	216	252	22	30	11	143	243	19
1881.....	138	3.0	79	59	62	76	11	25	12	41	45	4
1882.....	45	0.9	24	21	16	29	.....	3	16	7	18	1
1883.....	34	0.6	17	17	14	20	1	1	5	9	16	2
1884.....	97	1.8	39	58	41	56	.....	.....	8	28	57	4
1885.....	91	1.7	36	55	48	43	.....	3	6	24	38	20
1886.....	88	1.5	46	42	29	59	.....	13	2	41	30	2
1887.....	266	4.2	120	146	95	171	9	16	4	80	154	3
1888.....	207	3.1	101	106	91	116	1	29	10	87	80	.....
Total.....	5,043	4.8	2,417	2,916	1,705	2,072	212	301	361	1,427	2,486	256

* Not including Providence city.

CROUP, DIPHTHERIA AND SCARLATINA.—*Season and Mortality.*

The following Table will show the *influence of season* in regard to the mortality from croup and scarlatina for *thirty-five* years, and diphtheria for *thirty* years; and in which these diseases may be compared. The Table will give the average *monthly* and *quarterly* percentages of deaths from each cause:

TABLE LXXXVII.

MONTHS.	CROUP. 1853-1887.		DIPHTHERIA. 1858-1887.		SCARLATINA. 1853-1887.	
	Number of deaths.	Per cent.	Number of deaths.	Per cent.	Number of deaths.	Per cent.
January.....	328	12.66	365	9.68	646	11.85
February.....	268	10.84	260	6.88	579	10.63
March.....	220	8.48	270	7.15	530	9.73
First Quarter.....	816	31.48	895	23.71	1,755	32.21
April.....	184	7.09	226	5.90	441	8.10
May.....	128	4.93	242	6.40	481	8.83
June.....	116	4.47	227	6.00	418	7.69
Second Quarter.....	428	16.49	695	18.30	1,340	24.62
July.....	86	3.32	208	5.48	314	5.76
August.....	72	2.77	245	6.38	261	4.79
September.....	162	6.25	272	7.45	269	4.94
Thlrd Quarter.....	320	12.34	825	19.31	844	15.49
October.....	272	10.49	502	13.29	384	7.04
November.....	376	14.51	505	13.37	493	9.04
December.....	381	14.69	454	12.02	632	11.60
Fourth Quarter.....	1,029	39.69	1,461	38.68	1,509	27.63
Totals.....	2,593	100.00	3,776	100.00	5,448	100.00

TABLE LXXXVIII.

Mortality in the State from Suicide, with the Percentage of the Whole Number of Deaths, Sex, Parentage and Locality for twenty-four years, from 1865 to 1888, inclusive.

YEARS.	Number of Deaths. from Suicide.	Percentage.	SEX.		PARENTAGE.		STATE DIVISIONS.					
			Males.	Females.	American.	Foreign.	Bristol County.	Kent County.	Newport County.	Providence County.*	Providence City.	Washington County.
1865.....	12	.37	10	2	8	4	1	1	1	3	5	1
1866.....	11	.40	7	4	10	1	.....	.....	1	4	4	2
1867.....	15	.55	8	7	12	3	1	.....	1	8	4	1
1868.....	18	.69	15	3	14	4	1	3	2	4	7	1
1869.....	15	.49	14	8	12	3	.....	2	.....	4	9	.....
	71	.50	54	17	56	15	3	6	5	23	29	5
1870.....	27	.89	28	4	18	9	.....	2	2	11	10	2
1871.....	19	.62	14	5	18	6	1	3	1	5	9	.....
1872.....	18	.47	10	8	12	6	.....	3	4	3	7	1
1873.....	8	.19	6	2	7	1	.....	1	.....	3	4	.....
1874.....	18	.44	14	4	11	7	1	1	1	3	10	2
	90	.52	67	23	61	29	2	10	8	25	40	5
1875.....	26	.63	17	9	14	12	1	1	.....	6	13	5
1876.....	18	.46	15	3	6	12	.....	.....	1	5	10	2
1877.....	22	.52	16	6	15	7	.....	2	1	5	12	2
1878.....	21	.50	16	5	12	9	3	2	.....	5	7	4
1879.....	13	.31	10	3	5	8	.....	.....	.....	5	7	1
	100	.48	74	26	52	48	4	5	2	26	49	14
1880.....	10	.20	5	5	8	2	.....	1	1	6	2	.....
1881.....	23	.49	19	4	15	8	.....	5	3	.....	14	1
1882.....	31	.64	23	8	23	8	1	4	3	8	12	3
1883.....	25	.47	18	7	11	14	.....	.....	2	8	15	.....
1884.....	22	.43	20	2	13	9	.....	1	1	6	11	3
	111	.45	85	26	70	41	1	11	10	28	54	7
1885.....	20	.37	16	4	11	9	1	1	6	3	6	3
1886.....	17	.29	16	1	12	5	1	3	2	4	7	.....
1887.....	16	.25	13	3	8	8	2	.....	2	5	7	.....
1888.....	21	.42	20	1	15	6	.....	1	3	6	9	2
Total.....	446	.42	345	101	285	161	14	37	38	120	201	36

* Providence city not included.

The following Table shows the percentages comparatively of several prominent causes of death, in the aggregate of total mortality from specified causes in Rhode Island, during a period of eleven years, from 1877 to 1887, inclusive:

TABLE LXXXIX.

CAUSES OF DEATH.	YEARS.										
	1887.	1886.	1885.	1884.	1883.	1882.	1881.	1880.	1879.	1878.	1877.
Accidents (all kinds) ...	3.25	3.22	3.09	3.80	2.84	3.44	3.04	3.51	2.43	2.89	3.10
Apoplexy and Paralysis.	4.17	5.69	5.38	5.78	5.39	5.52	5.23	4.67	5.21	4.45	4.25
Brain, Diseases of	3.29	3.11	3.61	2.97	3.50	3.60	3.84	3.44	3.73	3.28	3.68
Bronchitis.....	2.77	2.96	3.09	2.29	2.04	2.08	1.80	1.98	1.47	1.89	1.62
Cancer.....	2.50	2.77	3.59	3.03	3.30	2.75	3.11	2.72	2.96	2.82	3.17
Cholera Infantum.....	5.60	6.27	5.16	6.31	4.73	6.77	5.15	5.43	3.81	3.97	6.08
Consumption.....	11.19	14.12	14.45	14.34	15.01	15.33	15.12	14.02	15.09	15.98	15.52
Convulsions.....	2.51	2.06	2.06	2.70	2.47	2.29	2.18	2.88	2.47	2.65	1.95
Croup	1.79	1.55	1.74	1.55	1.40	1.60	2.16	1.45	2.28	2.20	2.23
Debility*.....	1.18	2.91	2.45	2.87	1.14	2.69	2.61	3.09	2.35	1.91	2.65
Diarrhœa.....	2.09	1.59	1.55	2.20	2.55	1.87	1.65	1.52	1.26	1.25	2.11
Diphtheria	4.53	3.90	1.83	2.31	1.88	2.10	4.63	3.40	6.14	10.28	11.56
Dysentery	1.04	1.13	.68	.78	1.06	1.42	.90	.61	1.04	.95	1.22
Fevers.....	2.00	2.87	2.93	3.24	5.12	4.60	3.05	3.37	2.70	3.94	3.55
Heart, Diseases of	6.46	6.20	6.48	5.60	6.35	5.31	5.68	5.03	4.78	3.92	4.28
Hooping Cough.....	.32	.83	.79	.83	.17	1.48	1.46	.44	1.02	1.28	.75
Hydrocephalus.....	.41	.41	.31	.81	.87	1.02	1.20	1.01	1.36	1.65	1.29
Kidneys, Diseases of....	2.66	2.64	3.14	2.52	2.43	1.79	1.69	2.02	1.88	1.89	1.57
Liver, Diseases of	1.34	1.08	.87	.88	.83	1.21	.82	1.20	1.17	1.06	1.06
Marasmus.....	1.57	.22	2.15	1.62	2.02	1.62	1.11	1.27	1.16	1.30	.99
Old Age.....	4.38	4.69	4.95	5.68	5.22	5.89	5.29	5.95	5.22	5.25	5.00
Pneumonia.....	7.70	8.18	8.65	7.14	7.84	7.16	7.01	7.90	7.37	7.49	5.31
Scarlatina.....	4.20	1.50	1.70	1.88	.64	.94	2.96	9.99	7.37	2.03	1.46

* Not infantile.

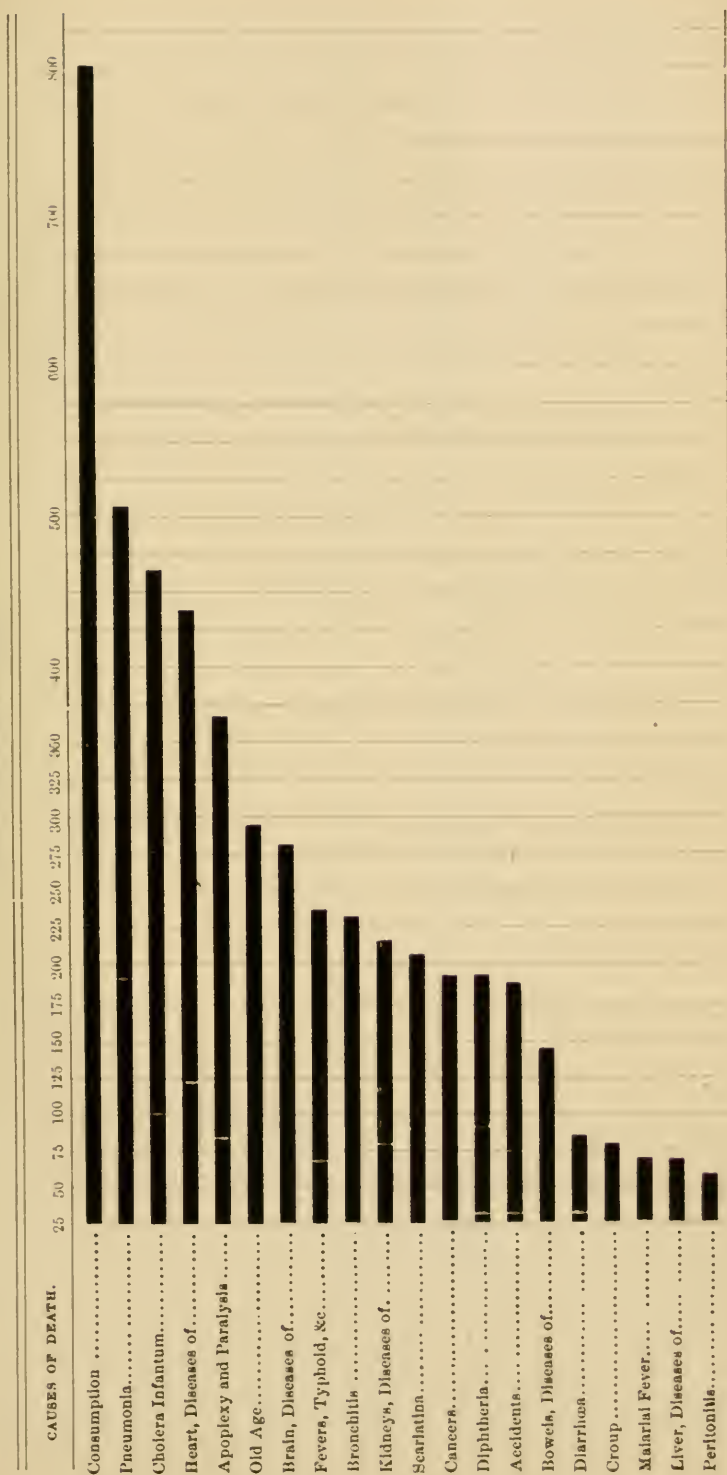
TABLE XC.

Principal Occupations and Causes of Death, from June 1, 1852, to December 31, 1888, inclusive, a period of thirty-seven years and seven months. Ages under 20 excluded.

OCCUPATIONS.	Whole Number.	Accidents.	Alcoholism.	Apoplexy and Paralysis.	Asthma.	Bladder Diseases.	Bowel Diseases.	Brain Diseases.	Bronchitis.	Cancer.	Diabetes.	Diarrhoea and Dysentery.	Dropsy.	Epilepsy.	Erysipelas.	Fevers, Malarial.	Fevers, Typhoid, etc.	Heart Diseases.	Hernia.	Insanity.	Kidney Diseases.	Liver Diseases.	Old Age.	Peritonitis.	Phthisis.	Pleurisy.	Pneumonia and Congestion of Lungs.	Rheumatism.	Stomach Diseases.	Suicide.	Tetanus.	
Bakers.....	92	5	12	1	...	3	1	1	5	1	3	8	1	1	5	1	3	8	1	1	9	6	2	5	...	20	...	4	3	2	1	...
Barbers.....	148	6	3	8	1	...	3	8	2	2	...	2	1	1	...	1	5	11	6	2	2	2	2	68	...	11	1	...	2	...
Blacksmiths.....	413	23	12	44	1	...	9	17	2	13	...	9	11	2	4	1	18	23	...	1	15	12	23	3	118	...	34	3	5	6	...	
Bleachers.....	40	1	...	1	1	...	1	2	...	1	...	2	...	...	1	...	2	2	...	...	1	...	3	2	14	2	3	...	1	...	...
Boiler Makers.....	39	4	3	6	...	...	...	2	...	...	...	1	...	...	...	...	1	3	1	...	...	...	...	...	...	14	...	1	...	...	...
Book Binders.....	18	...	1	...	...	...	2	2	...	...	...	...	1	...	...	...	1	1	...	...	...	...	2	...	6	...	1	...	...	...	...
Cabinet Makers.....	92	3	1	8	1	...	1	3	1	2	1	1	1	1	1	...	1	9	...	...	3	5	15	...	23	1	5	...	1	1	...
Calico Printers.....	48	2	5	4	1	...	1	1	...	2	...	1	1	...	...	...	...	6	...	...	1	1	3	...	13	...	3	...	...	3	...
Carpenters.....	1,278	105	18	101	2	12	21	42	11	43	5	31	24	5	9	1	63	106	3	11	46	26	98	9	322	5	106	12	13	23	2	
Carriage Makers and Trimmers.....	50	2	...	6	...	...	...	...	1	2	3	1	1	1	1	...	1	2	...	...	5	4	2	...	14	...	4	...	...	1	...
Cigar Makers.....	72	2	2	1	1	...	1	1	2	5	...	...	1	...	...	...	3	4	...	...	3	2	3	...	32	...	7	1	2	...	...
Clergymen.....	158	3	...	20	...	2	1	3	6	5	2	5	1	1	1	1	5	18	...	4	6	12	17	...	21	...	19	1	1	3	...	
Confectioners.....	29	1	...	1	1	1	1	1	1	1	...	2	1	...	...	...	2	2	...	...	2	1	...	1	8	...	2	...	...	1	...
Coopers.....	99	3	1	14	1	2	3	1	2	1	1	1	2	...	1	1	4	7	2	1	3	3	17	...	18	1	7	...	...	2	...
Dentists.....	15	...	2	...	...	...	1	1	...	1	...	...	...	...	...	...	3	2	...	...	...	...	1	...	2	...	2	...	...	...	...

Dyers.....	69	4	...	4	1	...	4	2	1	1	...	3	2	1	1	...	9	7	...	1	...	6	...	15	...	5	...	1	1	..		
Engravers.....	85	3	1	6	...	3	2	2	2	...	5	1	...	...	...	5	10	...	2	1	2	1	...	32	...	5	...	1	1	..	
Farmers, etc.....	4,735	193	38	5,216	81	102	116	34	208	30	95	156	14	52	7	236	468	16	26	121	105	833	9	656	29	381	40	37	63	11		
File Cutters.....	37	...	1	3	...	2	2	1	...	...	...	...	...	...	...	...	2	...	...	...	...	1	...	18	...	4	...	...	2	..	
Gas Fitters.....	31	...	2	4	...	...	...	...	3	...	...	...	...	...	...	1	1	...	...	3	...	...	...	14	...	1	...	2	...	...
Harness Makers and Saddlers.....	79	5	2	4	...	...	4	1	2	1	2	1	1	1	1	3	6	...	4	1	3	...	26	...	7	...	2	3	..		
Jewelers.....	628	24	11	43	2	5	8	11	9	9	3	13	6	2	6	1	37	51	1	13	23	15	4	2	276	...	31	3	8	11	..	
Lawyers.....	110	2	1	16	...	...	9	...	1	...	1	1	1	1	1	5	18	1	4	10	5	6	...	20	...	6	1	1	...	...
Machinists.....	856	49	8	77	2	7	11	33	8	20	6	18	16	4	6	41	73	1	6	34	14	33	2	284	7	95	6	13	12	...	...
Masons.....	524	35	6	49	2	9	9	14	9	27	3	5	9	...	2	23	42	1	6	26	7	48	4	96	2	67	3	13	5	...	...
Millers.....	31	5	1	3	...	...	1	...	1	...	1	1	...	...	...	1	1	...	...	1	1	3	...	1	...	3	...	...	1	...	...
Moulders.....	163	10	2	14	...	2	2	3	4	1	3	1	...	1	1	13	9	...	3	3	1	3	...	50	...	32	2	2	2	...	...
Musicians.....	40	3	1	6	...	...	3	...	1	1	...	1	...	...	...	2	3	...	1	3	1	1	...	8	...	3	1	1	...	...	...
Operatives.....	1,376	91	18	58	10	6	32	34	21	31	5	30	22	3	8	5	96	96	6	15	40	29	30	7	495	7	124	14	19	20	1	...
Painters and Glaziers.....	476	35	9	55	...	7	11	13	2	12	1	17	5	1	2	1	9	51	1	10	16	10	16	2	127	4	41	3	5	4
Pattern Makers.....	38	1	2	4	...	1	1	1	...	3	...	1	...	...	1	2	7	...	...	...	...	1	...	8	1	4	...	...	...	...	...
Physicians.....	190	4	3	28	1	2	5	11	2	5	3	5	1	...	1	4	26	1	5	6	6	...	12	...	36	1	14	1	5	2
Plumbers.....	46	6	...	2	...	1	4	...	...	...	1	...	...	...	...	1	3	5	...	...	1	...	...	16	...	5	...	...	...	...	...
Printers.....	131	4	2	8	...	2	2	3	3	6	1	1	2	...	...	6	10	...	1	7	1	3	2	45	...	12	2	2	2	...	...
Rubber Workers.....	56	1	...	4	...	...	...	...	2	1	2	1	...	...	...	4	2	...	...	2	...	...	...	30	...	7	...	...	...	...	...
Sail Makers.....	26	4	1	2	...	2	...	...	1	...	...	1	...	...	...	1	3	1	2	1	...	...	...	3	...	1	...	1	1	...	...
Shoe Makers.....	414	12	11	44	1	3	5	10	5	12	2	14	12	1	6	...	35	1	5	12	15	52	3	90	2	20	5	3	4	...	...
Silversmiths.....	64	1	2	3	...	...	1	3	...	1	1	1	1	...	2	3	6	...	...	3	1	5	1	23	1	5	...	...	...	...	...
Stone Cutters and Marble Workers.....	155	11	1	4	...	1	3	4	2	4	1	3	2	1	...	10	17	...	3	2	2	5	...	57	...	14	2	4	2	...	...
Students.....	49	3	...	...	...	...	1	4	1	1	1	1	...	...	...	10	1	...	...	1	...	...	1	20	...	3	...	...	...	...	...
Tailors.....	276	10	7	21	2	8	5	5	4	7	...	8	4	...	...	7	31	...	1	20	9	13	...	88	1	17	3	2	2	...	...
Tanners and Carriers.....	32	4	...	3	...	1	...	...	1	2	...	...	...	...	...	1	4	...	...	1	1	4	...	4	...	2	2	...	...	...	...
Teachers and Professors.....	90	3	...	7	...	1	1	4	3	4	1	3	1	...	...	9	3	...	1	2	2	5	...	32	...	5	1	1	1	...	...
Tinsmiths.....	74	5	2	5	1	...	...	...	1	...	...	...	1	1	...	5	3	...	1	1	3	4	...	30	...	6	2	2	1	...	...
Upholsterers.....	31	3	...	1	...	...	...	...	...	...	...	...	...	...	1	1	3	...	...	3	...	...	...	14	...	3	...	1	1	...	...
Wheelwrights.....	64	4	3	6	...	1	...	...	1	1	3	...	...	...	...	3	9	...	1	3	3	9	...	9	...	7	...	...	...	...	...
Total.....	13,567	671	183	1,217	48	155	252	386	146	454	70	282	331	41	110	25	678	1,912	37	124	418	309	1,293	49	3,392	61	1,142	113	151	192	16	

Diagram III. Exhibiting the comparative mortality by absolute number of decedents, from twenty principal causes of death in Rhode Island, in 1888.



ERRATA.

Page 24, line 2, read :

Scarlatina.....20|27|24|16|12|14|12|10|9|8|4|10|4|7|3|3|1|2|5|6|6|3|1|..|91|116|101|106|207

Page 152 :

Diseases of the brain, in the summary for the *seasons* of the year, include cerebro-spinal and tubercular meningitis, and hydrocephalus, with diseases of the brain proper.

APPENDIX.

NOMENCLATURE OF DISEASES,

OR

CAUSES OF DEATH.

NAMES OF CAUSES OF DEATH.

It should be stated that the nomenclature of diseases in the nosological arrangement on the following pages is not intended to include the names of the whole list of morbid phenomena affecting the human organism, but the names of such only as are directly the **cause of death**, or such as ordinarily predispose to or set in motion the morbid processes that end in death.

In the construction of the classification now adopted, use has been made of the results and conclusions of a committee of the Royal College of Physicians of England, and from such other sources as were accessible, and from examination of the classifications in use in different countries in Europe and America. It has been the design to have all these classifications based on observed facts and most advanced conclusions in relation to pathological processes and morbid conditions, inductive, causative, progressive and ultimate.

The statistical nosology will consist of two lists of causes of death,

A TABULAR LIST AND SUPPLEMENTAL LIST.

The **TABULAR LIST** comprises the chief or primary causes of death which will be used in Table IX, on Classification and Percentage, in the preparation of the Registrar's annual reports, and will, therefore, include all those named in the **SUPPLEMENTAL LIST**, when the final arrangement is completed.

The **SUPPLEMENTAL LIST** is subordinate to the **TABULAR LIST**, and contains synonyms, or names of related diseases, which may be actually, or are supposed to be, causes of death, and which are in addition to those in the **TABULAR LIST**, and which are often found in **PHYSICIAN'S certificates of death**, as reported to the State Registrar. These will have a place, in alphabetical order, in Tables VII and VIII of the reports, and will be variously grouped under different heads in Table IX, as the figure which precedes each cause in the **SUPPLEMENTAL LIST** will correspond with the figure of the head, in the **TABULAR LIST**, under which that cause is placed.

NOMENCLATURE OF CAUSES OF DEATH.

CLASSES.

- | | | |
|----------------------------|------------------------|----------------------------|
| I. General Diseases.—A. | SPECIFIC AND FEBRILE. | (<i>Zymotic.</i>) |
| II. General Diseases.—B. | CACHECTIC. | (<i>Constitutional.</i>) |
| III. Special Diseases. —A. | FUNCTIONAL OR ORGANIC. | (<i>Local.</i>) |
| IV. Special Diseases. —B. | DEVELOPMENTAL. | (<i>Developmental.</i>) |
| V. Violent Deaths. — | FROM INJURIES. | (<i>Violence.</i>) |

SUB GROUPS OR ORDERS.

CLASS I.—Zymotic Diseases.

ORDER ONE, Miasmatic. ORDER TWO, Enthetic. ORDER THREE, Dietic. ORDER FOUR, Parasitic.

CLASS II.—Constitutional Diseases.

ORDER ONE, Diathetic. ORDER TWO, Tubercular.

CLASS III.—Local Diseases.

ORDER ONE, Diseases of the Nervous System. ORDER TWO, Organs of Circulation. ORDER THREE, Organs of Respiration. ORDER FOUR, Organs of Digestion. ORDER FIVE, Urinary Organs. ORDER SIX, Reproductive Organs. ORDER SEVEN, Osseous and Locomotory Organs. ORDER EIGHT, Integumentary System.

CLASS IV.—Developmental Diseases.

ORDER ONE, Of Children. ORDER TWO, Of Women. ORDER THREE, Of Old Age. ORDER FOUR, Of Nutrition.

CLASS V.—Violent Deaths.

ORDER ONE, Accidents and Negligence. ORDER TWO, Homicide. ORDER THREE, Suicide.

STATISTICAL NOSOLOGY.

CLASS I.—Zymotic Diseases.

TABULAR LIST.

For Table IX of the Registration Report.

ORDER One.—Miasmatic.

- I. One.—1. Carbuncle
2. Cholera, Asiatic
3. Cholera, Sporadic
4. Cholera Infantum
5. Cholera Morbus
6. Croup (Pseudo Membranous)
7. Diphtheria
8. Diarrhœa
9. Dysentery
10. Erysipelas
11. Fever, Bilious
12. Fever, Cerebro Spinal
13. Fever, Intermittent
14. Fever, Malarial
15. Fever, Typhoid
16. Fever, Typho-Malarial
17. Fever, Unspecified
18. Fever, Yellow
19. Influenza (Epidemic)
20. Measles
21. Mumps
22. Metria (Puerperal Fever)
23. Pertussis
24. Tonsillitis
25. Scarlatina
26. Small Pox
27. Varicella

ORDER Two.—Enthetic.

- I. Two.—1. Glanders
2. Gonorrhœa
3. Hydrophobia
4. Malignant Pustule
5. Septicæmia
6. Syphilis

ORDER Three.—Dietic.

- I. Three.—1. Alcoholism
2. Delirium Tremens
3. Inanition
4. Purpura and Scurvy

ORDER Four.—Parasitic.

- I. Four.—1. Aphæ
2. Worms
3. Other Parasites

SUPPLEMENTAL LIST.

Synonyms or Related Diseases.

ORDER One.—Miasmatic.

- I. One.—1. Anthrax.
Gangrenous Boil.
4. Entero Colitis, } Infan-
Gastro Enteritis, } tile.
10. Hospital Gangrene.
Pyæmia.
Phagadæna.
Phlegmon.
15. Infantile Fever.
Typhus Fever.
20. Rotheln.
21. Parotitis.
22. Child-bed Fever.
23. Hooping Cough.
24. Quinsy.
25. Scarlet Fever.
Angina Maligna.
26. Varioloid.
27. Chicken Pox.
Miliaria.

ORDER Two.—Enthetic.

- I. Two.—2. Stricture of the Urethra.
Gonorrhœal Ophthalmia.
5. Necrosis.

ORDER Three.—Dietic.

- I. Three.—1. Intemperance.
3. Privation.
Starvation.
Neglect.

ORDER Four.—Parasitic.

- I. Four.—1. Thrush.
2. Tape Worm.
Trichianasis.
3. Scabies.
Hydatids.
Porrigo, Favus, etc.

CAUSES OF DEATH.

CLASS II.—Constitutional Diseases.

TABULAR LIST.

ORDER One.—Diathetic.

- II. One.—1. Gout
 2. Dropsy
 3. Anæmia
 4. Cancer, Various
 5. Cancer of Breast
 6. Cancer of Stomach
 7. Cancer of Uterus
 8. Noma (Canker)
 9. Mortification
 10. Rheumatism

ORDER Two.—Tubercular.

- II. Two.—1. Scrofula
 2. Tabes Mesenterica
 3. Phthisis (Pulmonary)
 4. Hydrocephalus
 5. Tubercular Meningitis

SUPPLEMENTAL LIST.

- II. One.—2. Anasarca.
 3. Leucocythæmia.
 Chlorosis.
 4. Soft Cancer.
 Epithelioma.
 Melanosis.
 Lupus.
 Other kinds of Cancer.
 9. Bed Sore.
 Dry Gangrene.
 10. Rheumatic Carditis.
 Rheumatic Synovitis.
 Rheumatic Meningitis.

- II. Two.—1. Psoas (Lumbar) Abscess.
 White Swelling.
 Cretinism (Goitre).
 Adenitis.
 Morbus Coxarins.
 Pott's Disease.
 2. Tubercular Peritonitis.
 3. Hemoptysis.

CLASS III.—Local Diseases.

ORDER One.—Nervous System.

- III. One.—1. Cephalitis
 2. Cerebritis
 3. Apoplexy
 4. Paralysis
 5. Insanity
 6. Chorea
 7. Epilepsy
 8. Tetanus
 9. Convulsions
 10. *Brain Diseases**

- III. One.—1. Phrenitis.
 Meningitis.
 Cerebro Spinal Meningi-
 tis. (Sporadic.)
 5. Monomania.
 Fright.
 Grief.
 Melancholia.
 Dementia.
 Rage.
 6. Hysteria.
 8. Laryngismus.
 Lockjaw.
 Trismus Nascentium.
 10. Neuralgia, Cerebral.
 Neurasthenia.
 Disease of Spinal Cord.
 Necrencephalus (Ramol-
 lissement).

ORDER Two.—Circulatory System.

- III. Two.—1. Pericarditis
 2. Aneurism
 3. *Heart Diseases**

- III. Two.—1. Carditis.
 Endocarditis.
 3. Hypertrophia.
 Atrophia.
 Angina Pectoris.
 Syncope.
 Arteritis.
 Ossification of Arteries.
 Phlebitis
 Hydropericardium.
 Embolus.
 Thrombosis.

* Not otherwise placed.

STATISTICAL NOSOLOGY.

CLASS III.—Local Diseases.—Continued.

TABULAR LIST.

ORDER Three.—Respiratory System.

- III. Three.—1. Epistaxis
 2. Laryngitis
 3. Bronchitis, Acute
 4. Bronchitis, Chronic
 5. Pleurisy
 6. Pneumonia
 7. Asthma
 8. *Lung Diseases**

ORDER Four.—Digestive System.

- III. Four.—1. Gastritis
 2. Enteritis
 3. Peritonitis
 4. Ascites
 5. Ulceration of Intestines
 6. Hernia
 7. Ileus
 8. Intussusception
 9. Stricture of Intestines
 10. Fistula
 11. *Stomach Diseases**
 12. *Pancreas Diseases**
 13. Hepatitis
 14. Jaundice
 15. *Liver Diseases**
 16. *Spleen Diseases**
 17. *Bowel Diseases**

ORDER Five.—Urinary System.

- III. Five.—1. Nephritis
 2. Ischuria
 3. Nephria (Bright's Disease)
 4. Diabetes
 5. Calculus (Gravel, &c.)
 6. Cystitis
 7. Prostate, Disease of
 8. *Kidney Diseases**
 9. Bladder, Diseases of
 10. Testicles, Disease of

ORDER Six—Generative System.

FEMALE.

- III Six.—1. Ovarian Dropsy
 2. *Diseases of Uterus**

SUPPLEMENTAL LIST.

- III. Three.—2. Oedema Glottidis.
 5. Empyema.
 Diaphragmitis.
 Pneumothorax.
 Hydrothorax.
 6. Pulmonary Apoplexy.
 Hæmoptysis.†
 Congestion of Lungs.
 7. Grinders' Asthma.
 Miners' Asthma.
 Empysema.

- III. Four.—1. Glossitis.
 Stomatitis.
 Pharyngitis.
 Oesophagitis. Not
 2. Gastro Enteritis } In-
 Entero Colitis. } fan-
 5. Perforation of— tile.
 6. Congenital.
 Femoral.
 Inguinal.
 Scrotal.
 Umbilical.
 Ventral.
 7. Constipation.
 Obstipation.
 Perityphilitis.
 Typhilitis.
 9. Strict Oesophagus.
 11. Dyspepsia.
 Pyrosis.
 Gastralgia.
 Hæmatemesis.
 Melena.
 14. Gall-stones.
 15. Cirrhosis.

- III. Five.—3. Albuminuria.
 6. Cystorrhœa.
 8. Diuresis.
 Hæmaturia.
 Uræmia.
 9. Urethritis.
 10. Orchitis.

- III. Six — 1. Ovarian Tumor.
 2. Hysteritis Metritis.
 Uterine Ulcer.
 Polypus, Tumor.
 Ovaritis.
 Pelvic Cellulitis.

* Not otherwise placed.

† See Class II, Order Two—3, Sup. List.

CAUSES OF DEATH.

CLASS III.—Local Diseases.—Continued.

TABULAR LIST.

ORDER Seven.—Osseous and Locomotory System.

- III. Seven.—1. Bones, Diseases of . . .
 2. *Joint Diseases** . . .
 3. Vertebrae, Diseases of . . .

ORDER Eight.—Integumentary System.

- III. Eight.—1. Phlegmon† . . .
 2. Ulcer . . .
 3. *Skin Diseases*. . .

ORDER Nine.—Organs of Special Sense.

EYE AND EAR.

- III. Nine—1. Malignus Oculi . . .
 2. Ophthalmitis . . .
 3. Ossis Petrosi . . .
 4. Otitis . . .

SUPPLEMENTAL LIST.

- III. Seven.—1. Ostitis.
 Perio-titis.
 Fragilitas Ossium.
 Mollities Ossium.
 Rickets.
 Caries, Necrosis.
 Exostosis.
 2. Synovitis.
 Hip Diseases.
 3. Spine Diseases.
 Spine, Caries and Necrosis.

- III. Eight.—1. Abscess, part not stated.
 Boil.
 Whitlow.
 3. Roscola.
 Urticaria.
 Eczema.
 Herpes.
 Pemphigus.
 Ecthyma.
 Impetigo.
 Psoriasis, &c.
 Dermatitis (from burns, &c.).

CLASS IV.—Developmental Diseases.

ORDER One.—Developmental Diseases of Children.

- IV. One.—1. Still born . . .
 2. Debility, Infantile . . .
 3. Debility, Premature Birth . . .
 4. Cyanosis . . .
 5. Spina Bifida . . .
 6. Other Malformations . . .
 7. Teething . . .
 8. Innutrition . . .

- IV. One.—2. Asthenia.
 4. Atelectasis Pulmonum.
 6. Anus Imperforatus.
 Cleft Palate.
 Idiocy.
 8. Malnutrition.

* Not otherwise placed. † See Class II, Order Two—1, Sup. ‡ See Class I, Order one—10, Sup.

STATISTICAL NOSOLOGY.

CLASS IV.—Developmental Diseases.—Continued.

TABULAR LIST.

ORDER Two.—Developmental Diseases of Women.

- IV. Two.—1. Paramenia
 2. Childbirth*

ORDER Three.—Developmental Diseases of Old People.

- IV. Three.—1. Old Age

ORDER Four.—Diseases of Nutrition. Adolescent and Adult.

- IV. Four.—1. Atrophy
 2. Debility

SUPPLEMENTAL LIST.

- IV. Two.—1. Amenorrhœa.
 Chlorosis.†
 Climacteria.
 Menorrhagia.
 2. Miscarriage.
 Abortion.
 Puerperal Mania.
 Puerperal Convulsions.
 Phlegmasia Dolens.
 Cæsarian Operation.
 Extra-Uterine Fætation.
 Flooding.
 Retention of Placenta.
 Presentation of Placenta.
 Deformed Pelvis.
 Mammary Abscess.

- IV. Four.—1. Marasmus.
 Malnutrition.
 2. Asthenia.
 Exhaustion.

CLASS V.—Violent Deaths.

ORDER One.—Accident or Negligence.

- V. One.—1. Fractures and Contusions .
 2. Wounds, Unspecified . .
 3. Burns and Scalds. . .
 4. Poison
 5. Drowning
 6. Suffocation
 7. Various

ORDER Two.—Homicide.

ORDER Three.—Suicide.

- V. Three.—1. Wounds, Unspecified . .
 Wounds, Pistol or Gunshot .
 Wounds, Knife
 2. Poison
 3. Drowning
 4. Hanging
 5. Otherwise

- V. One.—1. Railroad and other Accidents.
 3. Lost at Sea.
 6. Asphyxia.
 Strangulation.
 7. Exposure.
 Cold Water.
 Frozen.
 Heat.
 Lightning.
 Surgical Operation.

- V. Two.—1. Infanticide.
 Patricide.
 Matricide.
 Fratricide.
 Filicide, &c.

* See Class I, Order One—22, Tab. List.

† See Class II, Order One—3, Sup.

SUGGESTIONS

CONCERNING

PHYSICIANS' CERTIFICATES OF DEATH.

It should be the endeavor to specify the causes of death as definitely and correctly as possible. It is not unusual to find a return of death with the physician's certificate naming the cause of death "Paralysis," "Paraplegia," "Fits," "Convulsions," "Dropsy," &c., which are merely secondary or consecutive causes, simply symptoms only, or results of some organic lesion or pathological derangement. Sometimes the **alleged cause** is really the *final cause*, as in a case of termination of life by paralysis, but the cause given as paralysis is **not the determining cause**. Apoplexy, or some lesion of the nervous centres, must be the original and determining cause of paralysis, paraplegia, hemiplegia, &c., and the determining cause should be stated as the primary in the return or certificate.

Convulsions are the symptoms or results of some antecedent or concurrent disease. They follow meningitis and other structural lesions of the nervous centres: they also occur from reflex derangement or disturbance of the nervous centres, as, in children, from intestinal irritation, or from inflammation, as in gastritis, enteritis, nephritis, &c. In such cases they may be contributory to death, and perhaps, in rare instances, a final cause, by inducing or taking the form of tonic or tetanic spasm. But as contributory, or as a final cause, they are simply concomitant. They should find place as secondary causes only in certificates of death.

"Fits" is too unmeaning a term to be used^{ed} in any case. The word in a medical sense literally means an attack, an occurrence, or succession of attacks of some physical or mental disturbance, as "fits of sickness," "fits of melancholy," &c., and is not properly used as synonymous with convulsions from any cause. It would be just as sensible to attribute a death to an "occurrence" or an "attack" as a cause, as to "fits," without other qualifications.

"Dropsy" and "Ascites" have been allowed to stand as determining causes of death because of extended use, and because of the obscurity with which their causes in rare instances are involved. We can scarcely conceive of a dropsical accumulation without antee-

dent organic or functional disorder, derangement of the absorbent or secretory system, or depravation of the blood. They are left in the tabular list with not a little reluctance. Paralysis is also left in the tabular list for a like reason, and with the same doubt of propriety.

It may be suggested that it is sometimes difficult, and occasionally impossible, to ascertain positively the chief or leading cause of death. The physician last in attendance may find several functional or structural diseases, the morbid conditions multiple and complex, and not only the initial derangement, but the succession of morbid processes, proximate, consecutive and ultimate, inextricably entangled and lost to discovery.

The careful diagnostician will, however, even then be able to *conceive the probable leading cause*, but, whether or not, he will be able at least **to ascertain the most prominent and controlling lesion or functional derangement then existing**, and which may reasonably be accepted as the primary cause of death.

The preceding remark applies very properly to cases of adventitious diseases which prove fatal, when occurring in individuals already suffering from some chronic disease of slower progress, as when fatal dysentery attacks a consumptive person, or one having chronic nephritis dies from pneumonia. **The acute disease** occurring independently of the chronic disease **is the chief cause of death**, although the fatal event may have been made more sure by the existence of the antecedent disease, and although the antecedent disease would have ultimately caused death.

In attributing death to scrofula, tuberculosis, tumor, cancer and other generic terms, as causes, **the organic structure or locality where the disease is developed** should always be given, otherwise such terms are very indefinite, and discredit the acquirements of the certifying physician.

The objects desired in presenting the preceding nomenclature of causes of death, and the suggestions following, are to subserve the purpose of greater uniformity in the use of nosological terms, and to promote the accomplishment of entire definiteness, accuracy and completeness in the physicians' certificates of causes of death.

The State of Rhode Island has a leading reputation for the completeness of its vital statistics. It is not excelled by any State in the Union. With the exception of two or three, there are no States that have approximate completeness of numbers of decedents, and fullness of statements of fact connected therewith. It is hoped that the physicians of Rhode Island will feel a professional and patriotic interest in the further elevation of the reputation of the State as a collector of accurate and complete vital statistics.

THE LAWS OF RHODE ISLAND

IN RELATION TO THE REGISTRATION OF

BIRTHS, MARRIAGES AND DEATHS, AND OF DIVORCE.

PUBLIC STATUTES, CHAPTER 85, AND PUBLIC LAWS, CHAPTER 747.

OF THE REGISTRATION OF BIRTHS, DEATHS AND MARRIAGES.

SECTION 1. The town clerks of the several towns, or any person whom the board of aldermen of any city, or the town council of any town, may appoint for that purpose, shall obtain, chronologically record and index, as required by the forms prescribed by section three of this chapter, all information concerning births, marriages and deaths occurring among the inhabitants of their respective towns; and on or before the first Monday in March, annually, shall make duly certified returns thereof to the secretary of the state board of health for the year ending on the thirty-first day of December next preceding, accompanying the same with a list of the persons required by law to make returns to them, who have neglected to do so, and with such remarks relating to the object of this chapter as they may deem important to communicate.

SEC. 2. The secretary of the state board of health shall receive the returns made in pursuance of the preceding section, and annually make a general abstract and report thereof, in form as prescribed by section three of this chapter, and publish not exceeding one thousand copies thereof, and for preparing, tabulating and publishing said annual report the sum of five hundred dollars shall be paid to the state registrar. Said returns, after such report is prepared, shall be deposited in the office of the secretary of state, who shall cause the same to be arranged, full alphabetical indices of all the names to be made, and the whole to be bound in volumes of convenient size and carefully preserved in his office.

SEC. 3. The blank forms required to carry out the provisions of this chapter shall, on application, be furnished by the secretary of the state board of health to clergymen, physicians, undertakers, town clerks, clerks of meetings of the

Society of Friends, and other persons requiring them, substantially as follows: The record of a birth shall state the date and place of birth, name and sex of the child, whether born alive or still-born, the name and surname, color, occupation, residence and birthplace of the parents, and the time of recording, so far as the same can be ascertained. The record of a marriage shall state the date of the marriage, place, name, residence and official station of the person by whom married, names and surnames of the parties, age, color, occupation and residence of each, condition, that is whether single, widowed or divorced, what marriage, that is whether first, second, third or other marriage, the occupation, birthplace and name of their parents, and the time of recording, so far as the same can be ascertained. The record of deaths shall state the date of death, name and surname of the deceased, the sex, color and condition, whether single or married, age, occupation, place of death, place of birth, names and birthplace of parents, disease or cause of death, and the time of recording, so far as can be ascertained.

SEC. 4. Every meeting of the Society of Friends, clergyman, and all others authorized to join persons in marriage, shall make a faithful record of every such rite performed by them, in manner and form aforesaid, and return the same for the last preceding month, on or before the second Monday of every month, to the town clerk of the town in which such rite shall have been performed; and no marriage shall be solemnized until the parties shall have signed and delivered to the person about to solemnize it, or to the clerk of a meeting of the Society of Friends, a certificate containing the information required for the record of a marriage, as prescribed by this chapter.

SEC. 5. The town clerk of every town shall annually, in the month of January, collect the information required by this chapter, in relation to all children born in the town during the year ending on the thirty-first day of December next preceding.

SEC. 6. Whenever any person shall die, or any still born child shall be brought forth in this state, the physician attending at such bringing forth or last sickness, if any physician so attended, shall, within forty-eight hours after such death or bringing forth, leave with the family, if any, or person having the care of the deceased, or the person bringing forth such still born child, or give to the undertaker or person who conducts the funeral a certificate stating, in case of a death, the name of the deceased, the date of the death, and the disease or cause of the death, and in case of the bringing forth of a still born child, the date and the cause of such child being brought forth still born. Provided, however, if the physician last in attendance shall not have knowledge of such death, or is otherwise reasonably prevented from leaving with the family or giving the undertaker such certificate within the time hereinbefore specified, or before the funeral or disposal of the remains of the deceased, he shall, within five days after having knowledge of such death by notification or otherwise, send to the town or city clerk or registrar of the town or city in which such death occurred a certificate, stating the name, date and disease or cause of death of such decedent.

SEC. 7. Every town council may appoint a sufficient number of persons to act as undertakers, removable at the pleasure of such council.

SEC. 8. No undertaker or other person shall conduct a funeral, or bury or deposit in a tomb, or remove from this state, or otherwise dispose of the remains of any deceased person or still born child unless he shall first obtain the physician's certificate required by section six of this chapter, if a physician was in attendance upon such person who has deceased, or the person bringing forth such still-born child, and shall return the same, together with his own certificate of the information required by section three of this chapter, to the town clerk of the town where such death or bringing forth took place. Provided, however, that in such towns as allow the burial or removal of the bodies of deceased persons without a permit from the town clerk, and the undertaker or other person who has charge of the disposal of the remains of the deceased person is unable to obtain the said physician's certificate, after reasonable attempts therefor before the burial or removal of the said remains, then the said undertaker or other person shall make his return as required by section three of this chapter, including the cause of death and the name of the physician last in attendance upon the deceased, immediately to the town or city clerk or registrar of the town or city in which the death occurred. He shall, also, within two days thereafter, notify the physician last in attendance upon the deceased person of the name and date of death of the same.

SEC. 9. Any town may make ordinances more effectually to attain the objects herein contemplated.

SEC. 10. The town clerks, or persons appointed as aforesaid, shall receive for each record of a death made and returned as required by law, and for each record of a marriage made and returned as required by law, twenty cents, to be paid to them out of their respective town treasuries: *Provided*, that the yearly compensation to be paid out of the town treasury as aforesaid, to any one town clerk or person appointed as aforesaid, who shall perform the duties prescribed by this chapter shall not be less than five dollars. Undertakers and others making returns of death as required by sections six and eight of this chapter, shall receive for each full report of a death made to the town clerk five cents in the cities of Providence and Newport, and ten cents in the other towns of the state.

SEC. 11. Every clergyman, physician, undertaker, town clerk, clerk of any meeting of the Society of Friends, or other person who shall wilfully or unreasonably neglect or refuse to perform any of the duties imposed on or required of him by this chapter, shall be fined not exceeding twenty dollars nor less than two dollars for each offence, one half thereof to the use of the town in which the offence shall occur, and one half thereof to the use of the person who shall complain of the same.

SEC. 12. Every clergyman, physician, coroner, undertaker, medical examiner, or clerk of any meeting of the Society of Friends, shall cause his name, residence and post office address to be recorded in the town clerk's office of the town where he resides.

SEC. 13. No letters of administration or letters testamentary shall be granted by any court of probate, upon the estate of any person, until the death of such person, or the facts from which the same is presumed, shall be duly certified, as near as may be, to the town clerk, in order that the same may be duly registered according to the provisions of this chapter.

SEC. 14. The town clerks of the several towns, the city clerk of the city of Newport, and the city registrar of the city of Providence, shall have the custody of all records of births, deaths and marriages of their respective towns, whether made under the statutes now in force or any former statute, and a certificate signed by them, certifying that any written or printed statement of any marriage, birth or death is a true copy of the record in their custody, shall be admitted as evidence of such marriage, birth or death.

SEC. 15. Births, marriages and deaths of non-residents shall be distinguished from those of residents, in the returns, by being arranged separately.

SEC. 16. The secretary of the state board of health may, from time to time, vary the forms of returns, and require such additional information as he may consider necessary to accomplish the object of this chapter. •

SEC. 17. The town clerks or other officers appointed under this chapter to collect, record and return the births in the several towns, shall receive fees therefor as follows: For making record and return of these facts as required by law, twenty cents each for the first fifty entries in each calendar year, and ten cents each for each subsequent entry and return; to be paid by the town in which the birth is recorded.

SEC. 18. The town clerks of the several towns, or other persons appointed under this chapter to collect the births in the several towns, shall annually in the month of January collect the facts concerning the births within their respective towns, required by this chapter; and shall, so far as practicable, at the same time collect the names of all persons liable to be enrolled in the militia, as required by title thirty-four; and the census of all persons between the ages of five and fifteen years inclusive, as provided by chapter fifty; and shall receive therefor such compensation as the town council or the board of aldermen of their respective towns or cities shall determine: *Provided*, that the city of Providence shall be exempt from so much of the provisions of this section as relates to the collection of the statistics of births.

SEC. 19. Blanks for the foregoing purposes shall be furnished, on application therefor, on or before the first day of December in the year preceding, by the state board of health for the collection of births, by the adjutant-general for the taking of the enrolled militia, and by the commissioner of public schools for the census aforesaid.

SEC. 20. The person or persons who shall discharge the duties required by section eighteen of this chapter, if other than the town clerk, shall make full return thereof to the town clerk of his or their town, on or before the tenth day of February next following.

SEC. 21. The returns required to be made by clerks of the supreme court, in relation to divorces, to the secretary of the state board of health, or a prepared abstract thereof, shall be published in the annual report on the births, marriages and deaths in the state.

SYNOPSIS OF THE LAW OF MARRIAGE.

CHAPTER 163, PUBLIC STATUTES.

SECTIONS 1, 2 and 3 show what kindred persons cannot marry, and declare marriages within prohibited degrees null and void.

SECTION 4 makes an exception in favor of Jews, within the degrees of affinity or consanguinity allowed by their religion.

SECTION 5 declares the marriage of persons having a husband or wife living, and of idiots and of lunatics, absolutely void.

SEC. 6. "Any ordained minister or elder of any religious denomination, who shall be *domiciled* in this state, and either justice of the supreme court, may join persons in marriage in any town in the state." (It will be seen that clergymen from other states *cannot* **LAWFULLY solemnize marriages** in Rhode Island.)

SEC. 8. Wardens in the town of New Shoreham may join persons in marriage in said town.

SECTION 9 provides that no minister, elder, magistrate or warden shall join persons in marriage, unless such person, *if residents of this state*, shall first present (to the clergyman or other person officiating) a certificate properly executed and signed by the town or city clerk or city registrar of the town or city in which ***EACH of such persons shall RESPECTIVELY reside***, and *if not residents of this state*, then from the town or city clerk or registrar of *the town or city in which the marriage shall be solemnized*, to the effect that the said town or city clerk or registrar has ***duly recorded the intention*** of marriage between the parties named in the certificate, the said certificate also setting forth the names and surnames of the parties, the age, color, occupation, birthplace and residence of each, whether either or both have been before married, and, if before married, whether the marriage intended is the first, second, third or other marriage, and also whether the condition of either or both persons previously married is that of a divorced person, and the names, occupation and birthplace of each of their parents; and no town or city clerk or city registrar shall issue such certificate to any minor person under guardianship, unless the consent in writing of the parent or guardian shall have been first obtained thereto;

provided, however, such certificate may be issued to a female over eighteen years of age, who has no parent or guardian living in the United States. (The legal minority of both sexes terminates at the age of twenty-one.)

SECTION 10 provides that every Society of Friends, and *every person* authorized to join persons in marriage, *shall certify* upon the certificate required in section nine of this chapter *the time when and the place where* the marriage shall have been solemnized by him, and *SHALL on or before the second Monday of every month*, return the certificate of every marriage solemnized by him during the last preceding month, to the *clerk or registrar* of the TOWN OR CITY *in which such rite shall have been performed*.

SECTION 11 forbids the solemnization of the marriage ceremony, by any person, when lawful objection is made thereto in writing, until such lawful objection be removed.

SECTIONS 12 and 13 provide that any person who shall join persons in marriage without first receiving the certificate required in section nine of this chapter, or otherwise contrary to or in violation of chapter 163 of the Public Statutes, shall be imprisoned not exceeding six months, or fined not exceeding one thousand dollars.

SECTION 14 provides that ALL PERSONS married without duly proceeding as required by chapter 163, shall be fined not exceeding fifty dollars.

SEC. 15. The solemnization of marriage shall be in the presence of two witnesses at least, besides the minister, elder or magistrate officiating.

SECTION 16 relates to marriage among Quakers or Friends, and among Jews, making them valid if in accordance with the forms, rites and ceremonies of the same respectively.

SECTION 17 provides that at least one of the parties to any marriage solemnized according to the manner and form of the Society of Friends, or rites and ceremonies of the Jewish religion shall, before the celebration thereof, sign and deliver to the town or city clerk or city registrar of the town or city in which such marriage is solemnized, the certificate required in section nine.

CHAPTER 167.

OF DIVORCE.

SECTION 1. Divorces from the bond of marriage shall be decreed in case of any marriage originally void or voidable by law, and in case either party is for crime deemed to be or treated as if civilly dead, or, from absence or other circumstances, may be presumed to be naturally dead.

SEC. 2. Divorces shall be decreed for impotency, adultery, extreme cruelty, wilful desertion for five years of either of the parties, or for such desertion for a shorter period of time in the discretion of the court, for continued drunkenness,

for neglect or refusal on the part of the husband, being of sufficient ability, to provide necessaries for the subsistence of his wife; and for any other gross misbehavior and wickedness in either of the parties, repugnant to and in violation of the marriage covenant.

SEC. 3. Whenever it shall appear that the absence, adultery, cruelty, desertion or other cause of complaint, as aforesaid, was committed or occasioned by the collusion of the parties, and done and contrived with an intention to procure a divorce, in such case no divorce shall be decreed.

SEC. 4. Whenever a divorce shall be had for the causes of affinity, consanguinity, impotency, idiocy, lunacy, or crime of either of the parties, the wife shall have restored to her all her lands, tenements and hereditaments; and a judgment may be passed for a restoration to her of all or such part of the personal estate specifically, or the value thereof, which has come to the husband's hands by virtue of the marriage, as the court from the circumstances of the case shall deem equitable.

SEC. 5. Whenever the divorce shall be occasioned by adultery, or other of the causes aforesaid, done or committed on the part of the wife, the husband shall hold the personal estate not secured to her by law, forever, and her real estate not secured to her by law during his natural life, in case they have had issue born alive of her body during the marriage, otherwise during her natural life only, if he shall survive her.

SEC. 6. The court may, in such case, allow the wife for her subsistence so much of her real and personal estate as they shall deem necessary or proper.

SEC. 7. Whenever a divorce is granted for adultery or crime on the part of the husband, the wife shall be entitled to dower in the same manner as if he were dead, unless the court shall decree alimony, chargeable upon the estate of the husband, instead of such dower.

SEC. 8. Whenever a divorce shall be had for adultery, or for any of the causes aforesaid, done or committed on the part of the husband, the wife shall continue to hold all her property, real and personal, secured to her by law, free from any right in or control over her disposition of the same, either during her life or at her death; and, if there be no issue living, shall be restored to all other her lands, tenements and hereditaments, if any there be.

SEC. 9. In such case the wife shall also be allowed out of the real or personal estate of the husband, or out of both, such alimony as the court shall think reasonable, not exceeding the use of one moiety of his real estate, during the life of the wife, and the property of one-half of his personal estate, having regard to the personal property that came to the husband by the marriage, and his ability.

SEC. 10. If there be issue living at the time of the divorce, the court, with regard to ordering restoration to the wife of such of her lands, tenements or hereditaments, if any, as may not be secured to her by law, and in regard to the amount of alimony to be allowed to her out of the property of the husband, may do as they shall judge the circumstances of the case may require.

SEC. 11. Divorces from bed, board, and future cohabitation, until the parties be reconciled, may be granted for any of the causes for which by law a divorce from the bond of marriage may be decreed, and for such other causes as may seem to require the same.

SEC. 12. In case of such divorce, the court may assign to the petitioner a separate maintenance out of the estate or property of the husband or wife, as the case may be, in such manner, and of such amount as they may think necessary or proper.

SEC. 13. Every petition shall be signed by the petitioner, if of sound mind and of legal age to consent to marriage, otherwise upon application to the court, and after notice to the party in whose name the petition shall be filed, the court may allow such petition to be signed by a guardian or next friend.

SEC. 14. All jurisdiction over divorce, alimony, separate maintenance, or the custody, education, and support of the children of persons divorced or petitioning for a divorce, is vested in the supreme court.

SEC. 15. Said court shall have no cognizance of or jurisdiction over any petition for the same, or either of the same, unless the petitioner shall, at the time of preferring such petition, be a domiciled inhabitant of this state, and have resided therein for the period of one year, next before the preferring of such petition.

SEC. 16. All such petitions shall be filed, heard and tried in the county in which the petitioner shall reside.

SEC. 17. The said court may, by general rule or otherwise, prescribe the notice to be given, within or without the state, on such petitions, and may issue such process as may be necessary to carry into effect all powers conferred upon them in relation to the same.

SECTIONS 18, 19 and 20 contain provisions in relation to citations to adverse party residing without the state, or in parts unknown.

SEC. 21. Whenever any citation, issued under the provisions of this chapter, shall be served by a disinterested person, such person shall return the same, having made oath thereon of the place where, the time when, and the manner in which he shall have made service of the said citations.

SECTION 22 provides for giving and ensuring proper and sufficient notice to the adverse party.

SEC. 23. The said court is empowered to regulate the custody, and provide for the education, maintenance and support of the children of all persons by them divorced or petitioning for a divorce, and of all persons to whom a separate maintenance may be granted, or who may petition for the same; to make such allowance to the wife, out of the estate of her husband, for the purpose of enabling her to prosecute or defend against any such petition for divorce or separate maintenance, in case she has no property of her own available for such purpose, as they may think reasonable and proper; and to make all necessary orders and decrees concerning the same, and the same at any time to alter, amend and annul for sufficient cause, after notice to the parties interested therein.

SEC. 24. The said court may authorize a married woman to whom a divorce from the bond of marriage is decreed to change her name, with the same rights and liabilities as if her name had not been changed.

SEC. 25. After the filing and during the pendency of any petition under this chapter, the supreme court may, as in equity, make such interlocutory decrees, or grant such temporary injunctions as may be necessary, until a hearing can be had before the court.

CHAPTER 198.

OF DIVORCES.

SECTION 5. The clerks of the supreme court in the several counties shall make returns to the secretary of the state board of health, on or before the first day of March, in each and every year, for the year ending on the thirty-first day of December preceeding, of all the applications for divorce, showing the number, the number granted, and the causes which are given for the application, but without the names of the parties, in accordance with the blanks which shall be furnished them by the secretary of the state board of health.

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